January 1985

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Issue No 34

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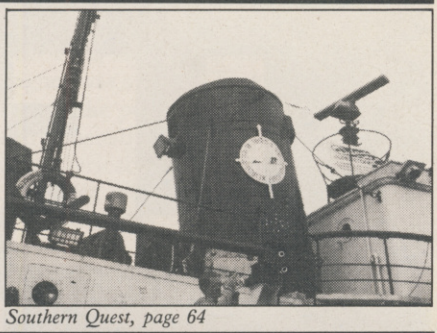

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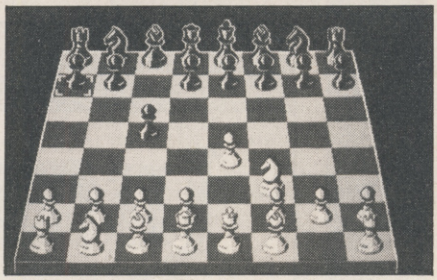

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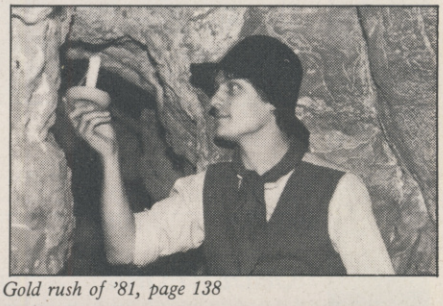

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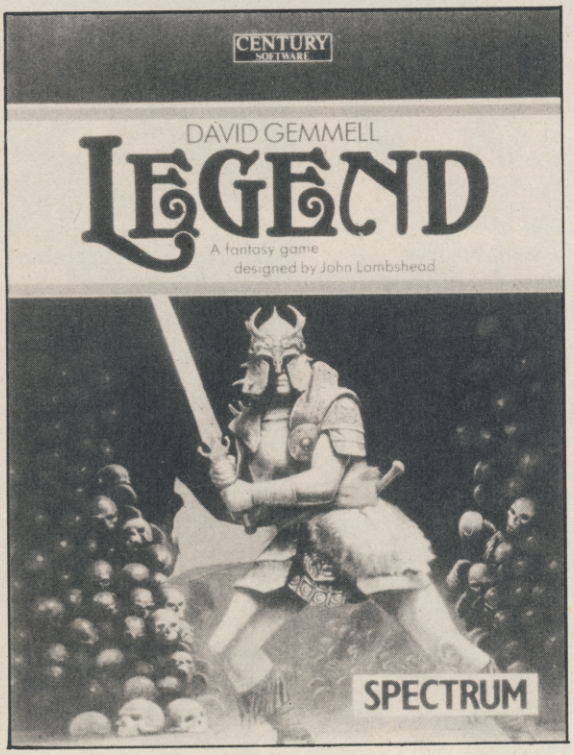

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THINGS TO COME

A YEAR AGO *Sinclairvoyance* speculated on Sinclair's expected move into the business market and the continuing success of the Spectrum. Events in 1984 confirmed both, though no-one could have anticipated the eccentric mishandling of the QL and the subsequent caution with which that machine was to be regarded by manufacturers and buyers alike. At the beginning of 1985 it is still uncertain whether the QL will sell in the quantities hoped for by Sinclair research, and which will justify large investment by software houses. The advent of disk drives, expansion boards and applications software from Quest is just one sign amongst many that the QL is nevertheless ready for lift-off.

What is more uncertain is the future of the Spectrum. Had not the Spectrum+ appeared, things would have looked decidedly dicey for our old friend. With Commodore. Amstrad, MSX and others prepared to slog it out in 1985 it is difficult to see how Sir Clive would have retained his market share.

The Spectrum+ might have changed all that. Internally the same as its little sister, it is an altogether different beast. In discarding those putty rubber keys Sinclair has transformed a games machine into an inexpensive and viable alternative to its rivals. Programming becomes faster and, once you have become accustomed to the all-white key legends, easier. Sensible word-processing is within reach. No more feats of dexterity to sample the dubious delights of inverse video, no more tugging and wiggling at that worn power lead . . .

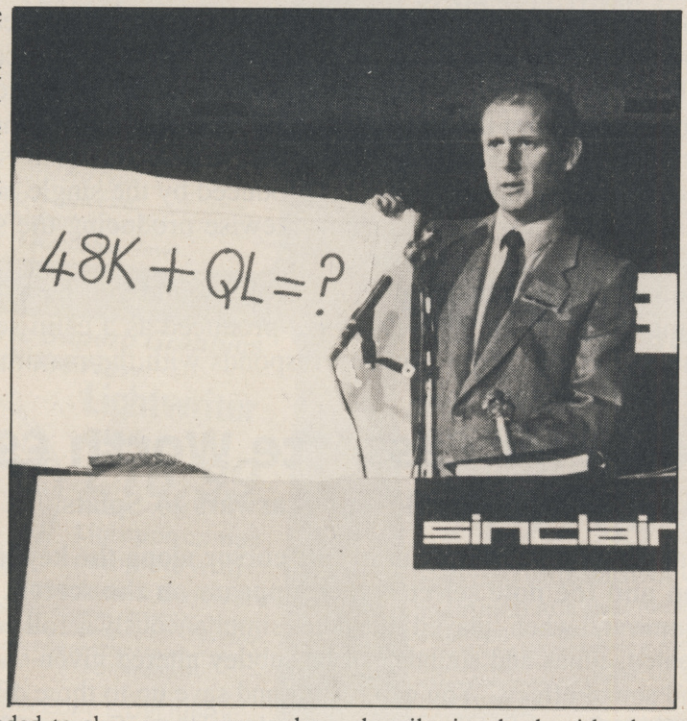
Even more attractive is the inclusion in the price of a slightly different version of the Spectrum Six Pack, intended to always accompany the Spectrum+, something which Sinclair did not make clear when the machine appeared. That software is worth more than £50.00 and consequently the £179.95 price for the Plus is not as exorbitant as it seems at first glance.

That leaves the old 48K, minus the now-discontinued software promotion, looking rather sorry for itself and it is inevitable that many potential customers will buy the Plus in preference. Sinclair Research hopes of course, that it has not merely split the market share it already has but in addition stolen some from Commodore and chums as well. Any price reduction in the 48K is again likely to increase that share without reducing sales of the Spectrum+ to any large extent. In other words, Sinclair has covered all the bases and is simply waiting for the away team to pitch. It can't fail to score.

Sinclair has further tricks up its lab coat sleeve. Whispers abound that the Plus might be further upgraded to take onboard the Interface 1 and even a cartridge slot. The basis for that speculation seems to be little more than the fact that the Plus was codenamed *Thunderbird,* and, as the ageing ones amongst is will know, there were five *Thunderbird* craft in the TV series. Nigel Searle has kicked that one into touch by explaining that the designer was a Ford Thunderbird fanatic, though he hasn't ruled out the possibility of upgrades.

Sir Clive too has been unusually garrulous on the shape of things to come, waxing lyrical about a portable in the pipeline. The portable micro will be battery-powered and incorporate microdrives. It will also have a flat-screen display — but then he said that when the QL was in planning.

The Spectrum Plus Handle, or the QL Minus, will retail at about £300. But don't hold your breath waiting: Sir Clive has said that it will appear in 1985, probably late 1985 — well, possibly 1986. Or even . . .



Despite all the carping about Sinclair's achievements there is no doubt they are rock-solid in the final analysis. One company to recognise that is ICL, and in announcing its OPD executive toy has signalled a new departure for Sinclair.

The OPD — One Per Desk — is a nifty combination of monitor, keyboard, microdrives and telephone handset which is the ultimate businessman's tool. It offers all the QL software and an amusing built-in speech synthesiser with 200 words for leaving rude messages on your telephone. It can do much more besides, but what interests us is the presence of Sinclair chips, microdrives and Basic in the design. Not only is the OPD an innovative approach to desk-top computers but it is the first time that Sinclair has been heavily involved with the product from another major company.

Lest you feel that in reaching for the business sky Sinclair Research might have neglected its down-to-earth home users, rest assured: it seems that the Spectrum+ has been bedevilled with the kind of teething problems Sinclair followers have come to expect and fondly treasure.

Some units have 'slipped' through Sinclair's QC net and a few fortunate users have discovered that not only are the keys a great improvement on their plasticene predecessors but are detachable as well. Some machines arrived with assorted keys scattered around the packaging like so many Scrabble tiles.

Middle Eastern carpet weavers used to incorporate deliberate flaws in their designs because only Allah could create anything perfect. Perhaps the distinctive Sinclair bugs and design faults are Sir Clive's errors of humility — his personal, desperate attempt to avoid hubris.

Bill Scolding

EXPLORING THE SENSE OF SOUND!

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Any microcomputer is capable of manufacturing sound, however in order to produce a single octave 'C' note with a frequency of 8372 Hz the signal needs attention over 16,000 times per second.

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The production of these sounds effects without the constant attention of the processor is now possible thanks to the AY Sound Chip, its flexibility makes it essential for a wide range of applications including music synthesis and sound effects generation, continuing the monitoring and production of sound after the initial command. More often than not realistic sounds require more than one effect and this function is provided by 3 independently controlled channels, as an example, compare the sound produced by the single note of C, with that produced by the chord 'C' and you will know just what I mean, likewise producing the sound of an explosion using all 3 channels gives games a totally new dimension.

Add to this the ability to alter the pitch tone and shape of the sound you have produced and it's flexibility is unlimited. In simple terms, imagine the note you have produced as a calm sea, by altering the pitch and shape you can produce waves, the top of the wave corresponds with the maximum volume and pitch of the note, which like the wave itself rises and falls.

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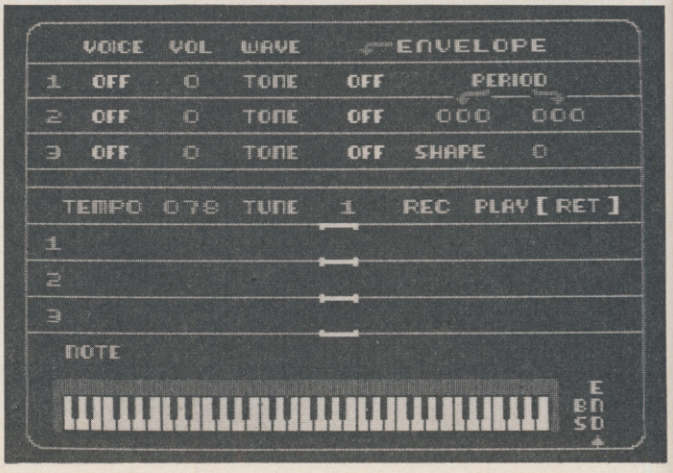

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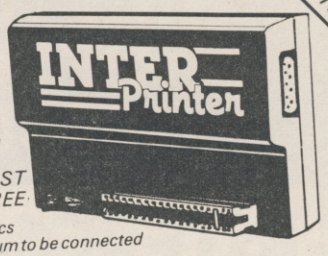

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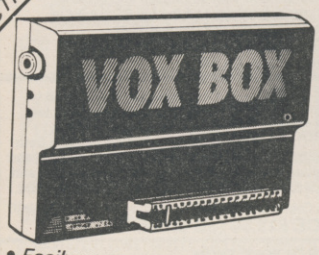

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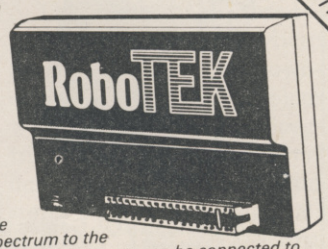

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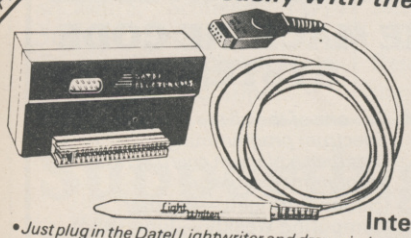

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IF YOU WANT to communicate with ZX-81 users worldwide, now is your chance.

ZX Exchange is a group of users dedicated to the ZX-81 and companion machines, TS-1000 and TS-1500. A newsletter, the *ZX Broadsheet,* is circulated at approximately bi-monthly intervals to users as far away as Hong Kong, Mexico and Australia.

The *ZX Broadsheet* covers the main areas of interest to ZX-81 users with routines as its main feature. Exchange Profile is a column in which people can talk about themselves, their interests, equipment and exchange information with other users.

If you would like to participate in this international user club you can obtain a trial issue of the newsletter by sending £0.60 (UK) or five International Reply Coupons to Nick Godwin, 4 Hurkur Crescent, Eyemouth, Berwickshire, Scotland TD14 5AP or telephone Nick on Eyemouth (0390) 50965 between 10am and 10pm.

Plus teething problems

THE SPECTRUM+ is only going through some minor 'teething problems' according to Sinclair Research, despite the fact that on some machines the keyboard falls to pieces.

Julian Goldsmith, of Sinclair Research, says: "With any new products there are bound to be problems. The suppliers are AB Electronics, Thorn EMI and Timex. If there is a problem and we hear complaints then we just talk to the suppliers and get them to make the glue thicker or add a millionth of a millimeter to the clip-on part of the keyboard. We have had complaints about the keyboard and of course we will take note of them."

Should problems occur with your Spectrum+ you are advised by Sinclair Research to take it back to the place of purchase. "The main responsibility, of course, is with us," Goldsmith admits. "Most retailers do their own QCing and we leave it to them to spot faulty machines.

Retail stores, such as Boots, are moaning because they cannot get enough of the Spectrum+. All the company would say is, "they are selling very well".

WH Smith is also not getting enough of the machines. A spokesman at one London branch commented that despite the slow start they had no problems with returns. They wished only that they could get a few more machines.

The tale at Smiths was repeated at The Buffer Micro Shop. Michael Howard, owner, says: "The only problem we have is getting the Spectrum+. We were late in ordering by one day and chain stores such as Smiths got all of them". That was the first delivery made and, at the time of writing, there had not been another one.

If you are still in a dilemma about what to do if your Spectrum+ keyboard falls to bits then Sinclair Research has had a suggestion passed on. Start chewing a lot of gum.

Sinclair admirer

THOSE microdrives have gained one ally in the form of ICL which has launched a computer called One Per Desk.

The machine, uses the QL circuit board, which includes the Sinclair ULA, with microdrives and includes a modem, terminal emulation software and monitor.

ICL is taking the Sinclair Research lead and supplying the Psion XChange software suite, with upgraded versions of Quill, Archive, Abacus and Easel, on in-built ROM in the package which is to sell for £1,200.

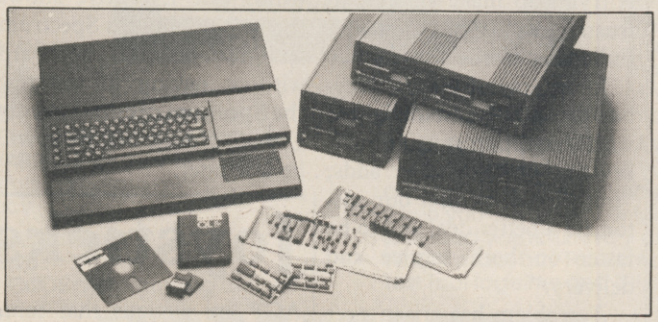
Sinclair Research is pleased that ICL has delivered its well-timed pat on the back for its pioneering stance in computing. A spokesman for the company says: "It is nice to see that other people are endorsing our technology."

Supporting role for Quest

A NEW RANGE of QL packages from Quest Automation turns the Sinclair machine into a powerful business microcomputer.

The software is headed by a 68K version of the CP/M, specially designed for 68000 processors. The 28.5K operating system is supplied either on 5¼in floppy disc for £49.50 or microdrive cartridge for £79.50. It includes an assembler, co-resides with QDOS and will support 3in, 3½in, 5¼in and 8in floppy discs. It can also be used with a Winchester disc unit.

Quest is also supplying a range of disc drives on which CP/M can be run. Those range from a 200K floppy at £249 to a range of Winchester discs, minimum storage 7.5 megabytes, which starts at £995.



If extra internal RAM is required Quest can supply a range starting with 68K for £99 to half-megabyte at £499. All the equipment can be stored in an expansion console costing £109.

To support its new system Quest has released two business packages, collectively called Tally.

The software is compatible with the Psion packages supplied with the QL which means that data can be transferred from the Quest packages to the Psion programs and vice versa. Quest says that it is a deliberate ploy which will be continued.

Wildest dream is fulfilled

SOMETHING you would never have thought of in your wildest dreams is renting software on a nightly basis.

A new company calling itself Wildest Dreams came up with the idea whilst discussing the problems of producing and distributing software. The games were to be available for rental in video shops nationwide from November, for the princely sum of around 50p per night.

The games are all new and will be for rental purposes only.

Asked about the subject of piracy, the company says, "Piracy occurs because people are loath to pay around £7.00 for a games tape, whereas 50p is a low enough margin to discourate piracy."

more news on page 10

Hacker's lèse-majesté

IF THE Duke of Edinburgh's Prestel Account can be broken into, think what fun a hacker could have with the Stock Exchange prices.

The latest exploit to reach the national newspapers and make Prestel tremble in its shoes is that of a hacker claiming to be a freelance writer of Micronet 800 — an information database and, ironically, part of the Prestel system.

Prestel received a telephone call recently asking staff to look at Page 1, Prestel's index page, accessible to only a few members of the Prestel team. INDEX was spelt IDNEX. The hacker had broken in.

Breaking into the system via one of the Prestel Development computers he found the identity number and password of Prestel's Assistant Editor. With that information he had enough ammunition to break into the system, call up anybody's ID and password and access any page on the database.

He decided to aim for the top, accessed the Duke of Edinburgh's Prestel account and had the time of his life sending messages from people who, at the time, were fast asleep — it being the early hours of the morning.

One message was sent from the Duke of Edinburgh to the General Manager of Prestel congratulating him with, "The household is very impressed with your work."

Another area cracked was Homelink — Prestel's home banking system where users holding accounts at the Nottingham Building Society and the Bank of Scotland can access accounts from home.

Two weeks after Prestel was bugged, Homelink sent out a message reassuring its customers that though Prestel had been hacked, the Homelink database was unbreachable. "Rubbish", came back the reply, "the Homelink database was broken into". It was signed by The Hacker using the Bank of Scotland ID.

Two weeks after the Prestel incident Homelink still had not changed the ID numbers and passwords.

Prestel got the message immediately and has made all the necessary security changes. One wonders, though, when and where the hacker will strike next.

Professional QL compiler

THE FIRST true compiler for the QL has been launched by Bristol-based software house Metacomco.

The compiler runs BCPL, Basic Combined Programming Language, which is widely used as the systems programming language on many different minis and micros.

BCPL is ideal for writing utilities, applications programs and even games. The package also supplies routines which will make the QL graphics and window facilities easier to use.

Metacomco is to sell BCPL for £59.95 and is also releasing a version of LISP for the same price.

Nordic cleans up

NORDIC KEYBOARDS, the company which has acquired the Fuller range of products after it went into liquidation a few months ago is trying to make amends to frustrated customers owning Fuller keyboards.

John Gray of Nordic Keyboards says he is delighted with the opportunity to market the products and adds, "but we aim to offer our customers a better deal and to be faster on both service and delivery."

A problem has arisen over faulty keyboards returned to Fuller before they went into liquidation.

"It is a knotty problem," says Gray, "because of Fuller's records. We have a lot of keyboards awaiting repair but without any attached documentation. As we come across keyboards with the owners' names and addresses we'll repair and return them."

On a more optimistic note, Nordic have launched the FDS Executive, a replacement keyboard for the Spectrum. The Executive allows the user to plug his Spectrum straight into the keyboard without having to unscrew the Spectrum case and at only £59.95, Nordic believe it will be a winner.

QL sales variable

THE QL has been greeted with mixed reactions by the retail trade. While stores such as WH Smith and Boots are pleased with sales, smaller outlets are not so happy.

A spokeswoman for WH Smith says: "The QL is selling out fast. We are having no problems with the machine but would like to see more software for it."

The same is true of Dixons. Dave Gilbert, a spokesman for the company, says: "We can't get enough of them. It is selling very well. We have had no problems with orders and we get all that we need."

Smaller shops are having a limited success with the QL. John Arundel of The Silica Shop in Kent says: "We have the QL and some people have bought them. They are slow to move though."

Michael Howard of the Buffer Micro Shop reports a similar story. "We are getting all the QLs that we need. They are not going in vast numbers but we are selling them."

Sinclair Research is confident that the slow start will turn into a rush when more people realise that the machine is in the shops.

A spokesman says: "Dealers are happy with the QL. Word is out that it is in the shops now and sales will increase accordingly."

Joysticks recall

AGF are anxious that some early customers who purchased Protocol 4 joystick interfaces may have sub-specification pre-production units.

The problem with those units is that they have an erratic or unreliable Kempston operation mode and the way to check this would be to type in the following program line with the Protocol 4 attached to the Spectrum, its mode switch in the down position and with the Kempston card inserted: Print IN 31, press ENTER.

If anything other than 0 is printed, the unit should be returned to AGF for a free replacement. The address for returns is: AGF Hardware, FREEPOST, Bognor Regis, West Sussex, PO22 9BY.

more news on page 12

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Grandmasters of Midnight

THE WINNER of the **Doomdark's Revenge** competition, in the October issue of *Sinclair User,* is Philip Middlewood of Great Barford, Bedfordshire.

The 25 second prize winners are: Chris Herbert, Frating, Essex; Jack Kelley, Penicuik, Scotland; John Northcliff, Adwick-upon-Dearne, Doncaster; Martin Dowie, Cupar, Fife; Matthew Stott, York; Stephen Trayler, Wimborne, Dorset; P Mills, Coventry; P W Camp, Cowley, Oxford; Richard Taylor, Lichfield, Staffordshire; Howard Davies-Carr, Stoke Bishop, Bristol; Kev Crocombe, Sheffield; David Finch, Barmouth, Gwynedd; R Kerr, Blantyre, Glasgow; Sheridan Pynes, Bexleyheath, Kent; Louis Clement, Richmond, Surrey; Kevin Mullowney, Beeston, Leeds; P D Tidy, Newbury, Berkshire; T Aviss, Hadleigh, Suffolk; C P Sempers, North Ferriby, North Humberside; Stuart Johnson, Sunderland, Tyne and Wear; J Rogers, Oldbury, Warley; Mark Wallis, Haywards Heath, West Sussex; Janette Fowler, Grangemouth, Central Region; Paul Matakitoga, Yeovil, Somerset; Christopher Ambrose, Stockport, Cheshire.

The 25 runners-up are: A G Simson, London SW9; Alan Rowlands, Telford, Salop; B White, Marlow, Buckinghamshire; Glen D Brock, Cheney, Oxfordshire; J Ellis, Paignton, Devon; Andrew Edwards, Leicester; Alex Hughes, Solihull, West Midlands; Ian Morris, Bovey Tracey, South Devon; Ben Wharton, London, NW6; Michael Park, Scarborough, North Yorkshire; M H O'Connor, Crediton, Devon; Jean-Yves Rouffiac, London, NW1; S Stanway, Trentham, Staffordshire; C D Sheldon, Swansea; Elane Davidson, Dumbartonshire, Scotland; Russell Keyte, Southampton; Ian Clark, Edinburgh; Dave Freeman, Purley, Surrey; S L Brasington, Rhyl, Clwyd; Chris Boorn, Gosport, Hampshire; G C Taylor, Crossford, Fife; Ian McVicar, Mount Blow, Clydebank; G Walton, Willenhall, West Midlands; George Turnbull, Leeds, West Yorkshire; Alan Gough, Southampton.

Piracy policemen

A FIGHTING fund has been established by the Guild of Software Houses which will be used against piracy.

Contributions to the fund will initially be made by the group's 34 members but Paul Duffy, General Secretary of GOSH, states that anybody can put money into the pool. "We would also like to get publishers and other people connected with the industry involved."

Duffy went on to say that GOSH wants to bring a major case against a software pirate. "That involves a lot of money, perhaps as much as £100,000. Even if we lose that will give us good grounds to go to MPs and say that the law does not stop piracy.

"We are writing to local councils telling them that if school equipment is used for piracy then we will hold the school responsible and prosecute them."

The comrades' conundrum

A £25,000 prize is being offered to the first person who can crack **Eureka!,** a five part arcade/adventure game for the Spectrum.

The scenario for the adventure, featured in Software Scene this month, was penned by games wizard Ian Livingstone and the product is being marketed by Domark, a company run by Dominic Wheatley, grandson of the novelist Dennis Wheatley, and Mark Strachan.

Domark claims that the game was the result of 10,000 man hours by a Hungarian programming team behind the Iron Curtain. The team of 20 includes four graphic artists, two musicians, a professor of logic and an Oscar winning cartoonist.

The competition ends on 31 December 1985 and Domark believes that it could take 15 months to solve.

THE ADVENTURE EVENT OF THE YEAR BY

JOHN SHERRY

The Prince

WINNER OF THE 1984 CAMBRIDGE AWARD

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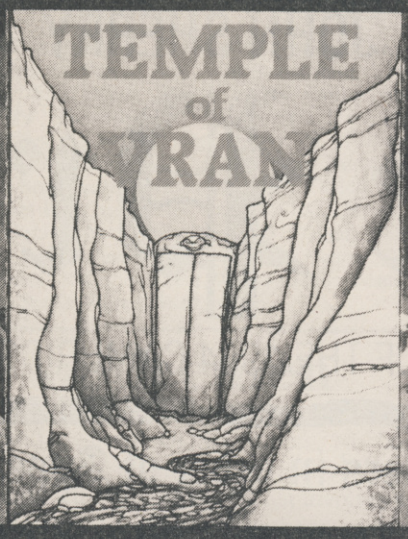

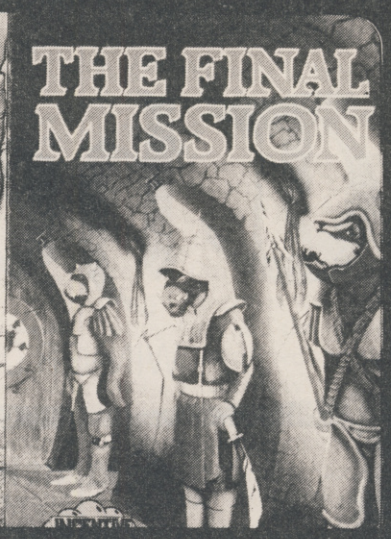

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PLUS

- ***SYSTEM 15000*** We interview Lee Kristofferson, the rock star hacker behind the cult adventure.
- ***QL NEWS*** The first of our regular round-ups of all that is happening on the QL front.
- ***ADVENTURE PROGRAMMING*** John Gilbert starts a six-part complete course in programming artificially intelligent adventure games.
- ***SPECIAL OFFER*** on a spreadsheet, word processor and graphics package from McGraw-Hill.
- ***SOFTWARE SCENE*** **Underwurlde, Knight Lore, Doomdark's Revenge, Lode Runner, Jasper** and many more.

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50 TIPS FOR BETTER SINCLAIR COMPUTING

Clive's dive

REPORTS begin to filter through of strange happenings at **Sir Clive's** London residence earlier in the Summer. While the final details to the refurbishment were being carried out, the basement flooded. Workers carrying pot plants to the roof garden were stuck in the lift. To cap it all, Sir Clive's jacuzzi wouldn't work. How galling it must be to come home from a hard day dealing with QL complaints only to discover your hi-tech bath is bugged as well . . .

We cannot imagine Sir Clive relaxing in his jacuzzi without some form of mental stimulation. As a tamer alternative to dipping **Acorn** bigwig **Chris Curry** in the pool — as reported in *Microscope* — he might enjoy reading the first issue of *Micro Arts*. The foreword of this extremely pretentious magazine was penned by one **Clive Sinclair,** and contains a lyrical exposition of the therapeutic qualities of hacking. "It is the Computer personality who dares face change without feeling the sense of loss that goes with the departure from the womb" rambles 'Clive'. We know he wants to abolish doctors and schoolteachers in favour of computers, but the Spectrum as a substitute for motherhood? . . .

Talking of mothers, Ferrari-lover **Bruce Everiss,** former operations director of **Imagine,** has been holding forth to any journalists still prepared to listen to the 'true' story behind the downfall of Imagine. In the interests of simplicity, Everiss omits to mention such obscure events as the bugging of **Colin Stokes'** telephone, the dawn raid on his house, the accusations flying around that Imagine went so far as to hire private detectives to report on the plans of other software companies. The Gospel according to Bruce now has it that Imagine's directors were simply young, green, and foolish enough to actually believe all the harmless untruths — sorry Bruce, totally justifiable marketing hype — that St Bruce was telling about the company . . .

MARK FIDDIAN of recently launched Streetwise Micros tries to flog a Spectrum + to Topo the redundant robot. Next month, when the organisers finally persuade Topo to turn the black box upside down, we shall expect further news on what happens when all the keys fall on the floor.

Next, according to Bruce, is the possibility of a book about how the games industry works. Readers are invited to send in their ideas for the title — 20,000 unused copies of **Schizoids** for the best entries. . .

Liverpool hype is not the only hype around. **Haresoft,** producer of the intensely boring **Hareraiser** competition/game, has informed a stunned world that a clue to the puzzle was revealed by TV personality **Anneka Rice** in Harrods one Saturday. Who, if anybody, was there to hear the golden girl's words of wisdom is not stated on the press release, but if anyone did perhaps they could let us know what the clue was and we can pass it on to whomever, if anybody, has bought the game. . .

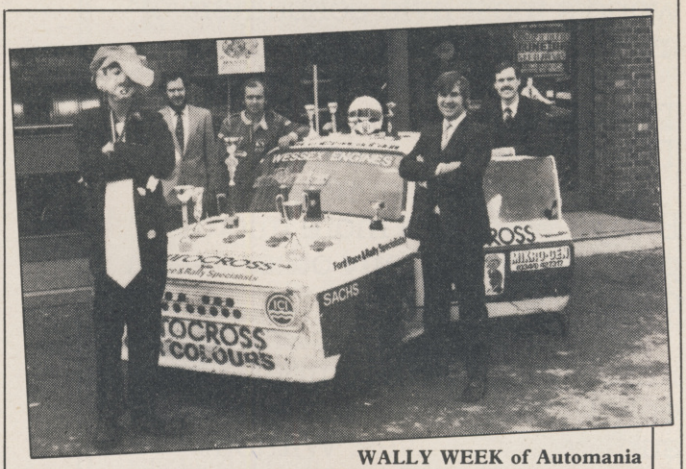
A further item from the prolific Haresoft PR people sheds light on the decision to release the game in two parts: "To make it fun and enable competitors of all ages to participate." Bet you thought it was just to make more money. . .

What with hackers infiltrating Phil's Prestel account, it seems the **Windsors** are getting plenty of free publicity from the micro-world. Now comes news of **Di's Baby,** a new game from **Bad Taste Software.** Gremlin will report further as soon as a convenient bedroom window is left open. . .

Great news for **Spectrum +** owners. **Cheetah,** flushed with success at abolishing everybody else's joysticks with the toothless infra-red **RAT,** has announced that all its software and hardware is compatible with the new Spectrum. Not only has the company achieved full compatibility incredibly quickly following the Spectrum + launch, it has even managed to do it without spending so much as a penny on the operation — excepting of course the cost of writing the press release. . .

Brazen Backslappers' award for January must surely go to **Hewson Consultants.** The company has presented a gold cassette — no, not **Alchemist** with the game wiped off — to its own programmer **Mike Male** for selling 100,000 cassettes of his games **Nightflite II** and **Heathrow ATC.** Mike has made so much money out of the games, we are told, that he has been able to buy his own aeroplane. . .

Finally, to prove we can play the game as well as anyone else, hot news from the Turkish desert via the back pages of *Computing* magazine. Apparently one of the paper's correspondents was on holiday in the remote east of the country and seeking an English newspaper to read over his curd cheese and olives. The only paper available in the whole town was *Sinclair User* — copy upon copy. If you know anything more about the great yearly migration of computer magazines along the caravan routes to the mystic Orient, please write to: Gremlin, Oasis 37, The Road to Samarkand, Babylonia. . .



WALLY WEEK of Automania and Pyjamarama embarrasses his Mikro-Gen pals in bad taste pic of the month. Wally is peeved that the universe does not think his games are better than Jet Set Willy or Kokotoni Wilf, and wants readers to vote on the matter. Wally is the one on the left.

First, a question.

Who do you think are the world's most avid consumers of microcomputers?

The ingenious Japanese? The fashionable French? The acquisitive Americans?

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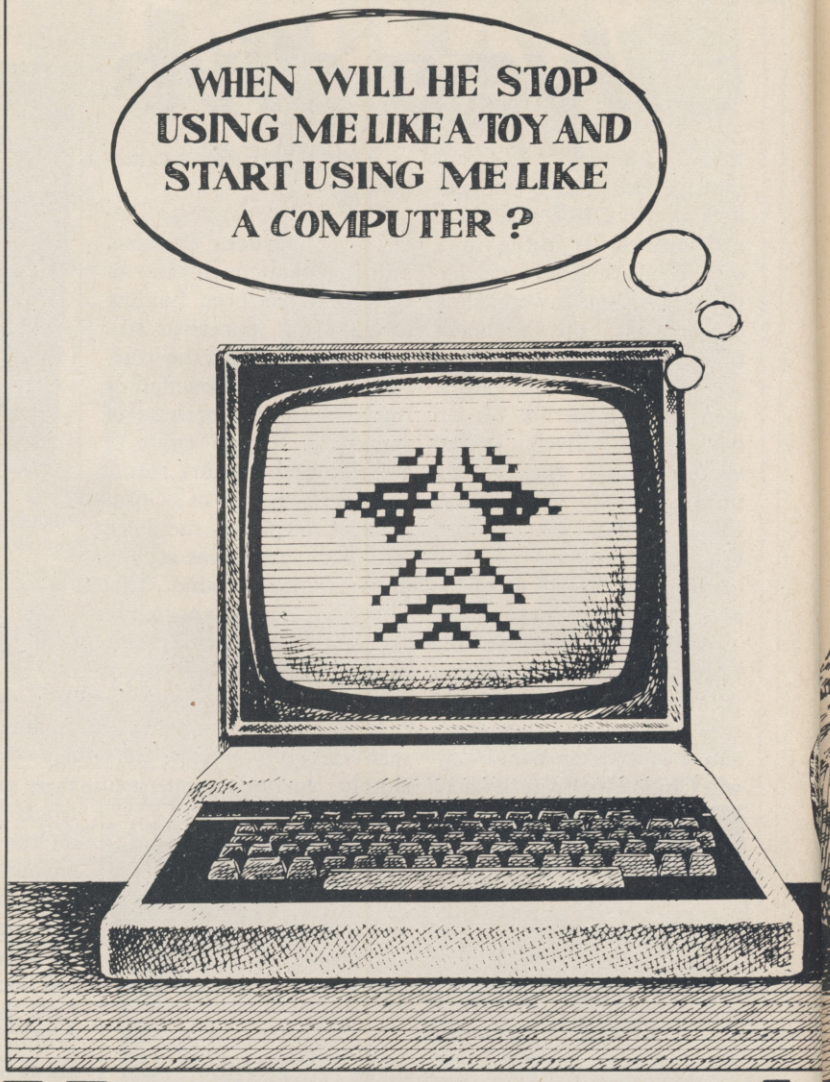

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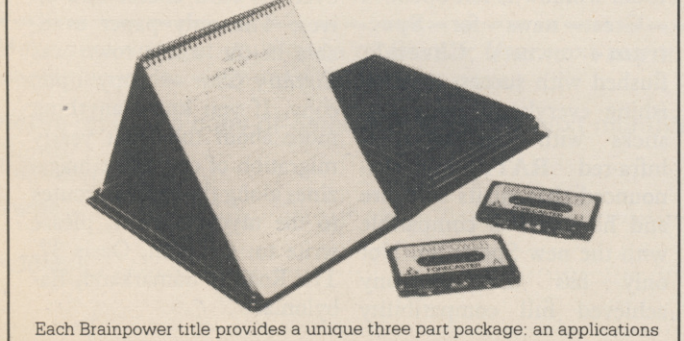

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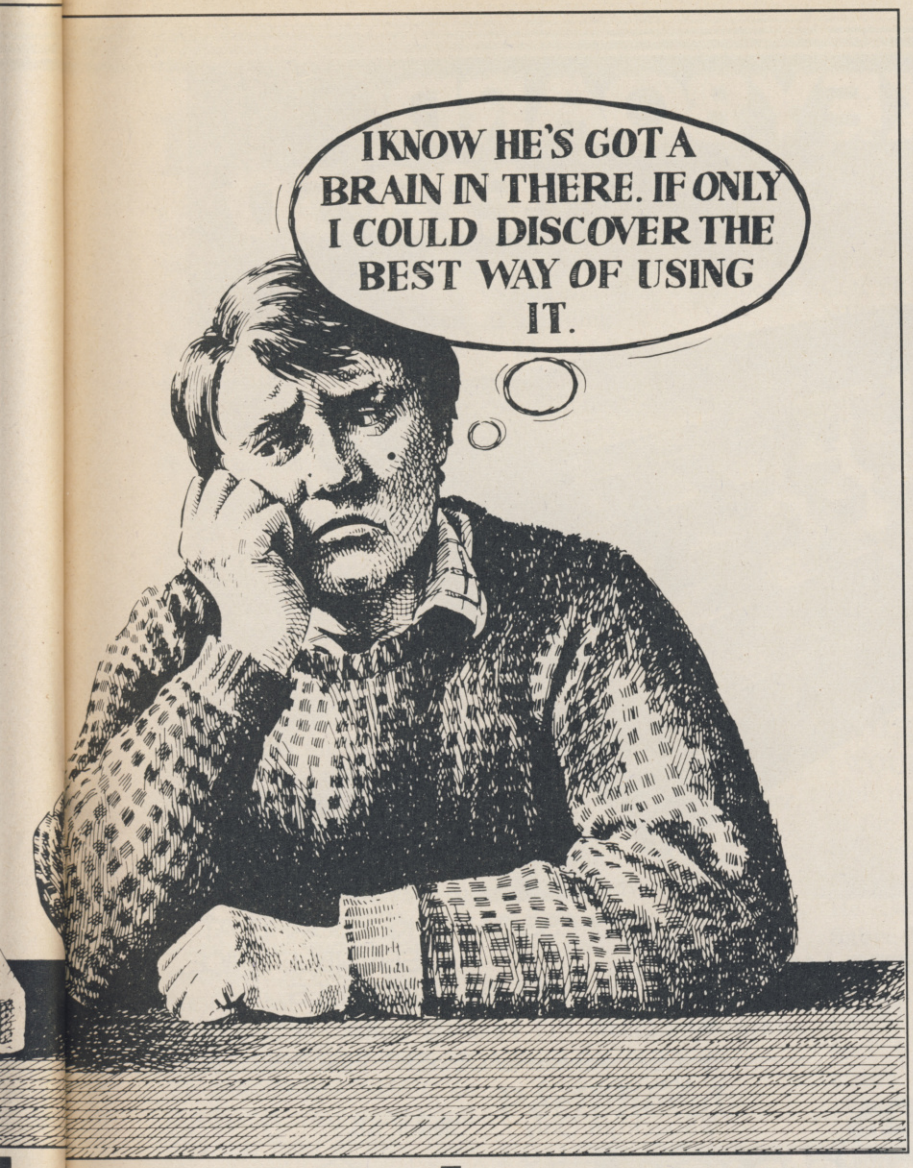

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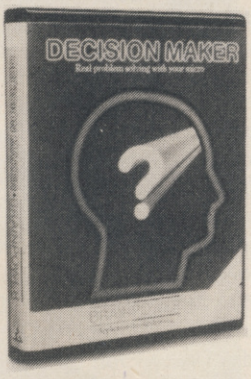

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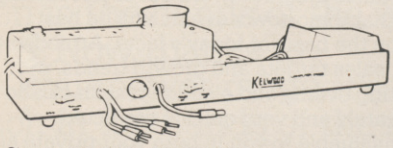

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Irate women bite back

I FELT I HAD TO comment on the news article entitled 'Computer machismo' in the November issue.

As a woman who has been working in the microcomputer industry for a number of years I too am extremely concerned about the lack of female interest in computers.

I do not, however, agree with the view of Ebury Software that publishing software under the *Good Housekeeping* title is going to do anything to help generate more interest. This is an extremely patronising attitude for Ebury to take, and one which will only help to further alienate women from computers and increase the sexist attitude of software publishers.

What Roger Barrett does not include in his — typically male — list of 'positive, traditional skills women have' is creativity. My own personal view is that just as soon as languages like **Logo** gain more recognition throughout the industry and begin to go into homes many women will find that most of their fears about computer programming are nonsense.

The important thing about Logo as compared to packages such as the *Good Housekeeping* type is that it gives people an outlet for creativity as well as programming or learning about computers. Creativity, which for many women has been lying dormant for a long time, will remain buried forever, if companies such as Ebury Software have their way.

Christine Roberts,
London NW1.

Accurate Adspeak?

IT WOULD APPEAR that the whole publishing industry dealing with magazines and books really needs to examine its methods more closely. Computing requires the utmost accuracy in all aspects of programming, yet in all publications, the number of mistakes which occur is appalling.

In addition, although much of your income is derived from advertising, some of the advertising material verges on downright deceit. Keyboards are a prime example. Most adverts state 'five minutes and a screwdriver'. Yet we then read reviews where screwholes won't line up, casings have to be cut and other horrors. Some advertisers would surely have difficulty in explaining their blurb to the Advertising Authority, and not just on keyboards either.

Why can't we have magazines which don't have mistakes and advertisers who get a little closer to the truth about their products?

A J T Longhurst,
Desborough,
Northamptonshire

Peripheral round-up

I AM getting a ZX Spectrum this year for Christmas and after reading every advertisement for joysticks and interfaces in your magazine I would like to know which is the best to buy.

Chris Wilcox,
London NW6.

● *The 1985 Sinclair User Annual has an up-to-date round-up of the best joysticks and interfaces manufactured during the last year.*

Protective software

THERE WAS an article in the September edition of *Sinclair User* about how to protect your programs from software pirates. The article showed several ways of doing that for the Spectrum including making a line with the number 0.

For ZX-81 users who would like to do the same, type in a line (e.g. 10 REM COPYRIGHT) and press NEWLINE; Type in POKE 16510,0 and NEWLINE; Press NEWLINE again and you will see '0 REM COPYRIGHT.'

That line cannot be edited and cannot be erased by typing in 0 and then NEWLINE.

Andrew Fox,
Ipswich, Suffolk.

Sabre Wulf king deposed

I WOULD just like to say, in reply to Des Claypole's letter in the November edition of your excellent *Sinclair User,* that he has now abdicated. He claims himself to be the **Sabre Wulf** king but I finished on an earlier date than June 7 on the very day that I bought the game. I considered it so simple that it wasn't worth writing in about. So I now claim to be the mega-supreme Sabre Wulf emperor.

R Worden,
Preston,
Lancashire.

Clamp down on pirates

I READ with interest the letter from Mr Dickinson — November, *Sinclair User* — who mentioned how he had to clamp down on the abuse of his school Spectrums for tape-copying.

There can be no doubt that a great deal of piracy goes on under the aegis of schools, and that some-called computer clubs are little more than mutual copying circles. That is not only a disaster for the software business; it is an educational catastrophe too, as witness the letter on the same page from Colin Baxter who can see nothing wrong with making a copy of a tape which he cannot afford to buy. That can only be because he has not been taught to.

What happens outside the school is not the school's concern, but it is the responsibility of the schools, as much as of parents, to teach computer-owning youngsters not to steal copyright work, and if they do not computers will do more harm than good to those who are given them.

Andrew Turek,
London NW11.

Beat Daley's world record

My friend and I have recently bought **Daley Thompson's Decathlon.** We played for 1 hour 45 minutes non-stop, and reached the final score of 1,181,160, and cleared 27 sheets containing five events in each sheet on day one.

Kirk Green,
aged 14,
Paul Bush,
aged 15,
Ilford, Essex.

Sick CUBs recalled

CALLING all CUB QL-compatible users.

A supplier's component fault is suspected on model numbers 1451/DQ/3 and 1451/MQ/3 with serial numbers between 85692 and 103317.

To enable us to rectify the situation, therefore, I should be grateful if readers with such models telephone David Kaye on Bradford 726500 so that we can make arrangements for the collection of their monitors for the necessary up-grading to be carried out.

The cost of this operation will be borne by Microvitec PLC.

Tony Fall,
Marketing Manager,
Microvitec.

more letters on page 20

Getting the printer blues

I HAVE just spent a day in Exeter unsuccessfully trying to buy a printer for my Spectrum.

I was told that the ZX printer is no longer available: "We don't stock them any more, they gave us too much trouble."

I found that the Alphacom 32 had leapt up in price by £20 or so. "That happened when the ZX printer was withdrawn."

No supplier could show me a printout in black ink on white paper.

No supplier had a printer linked up to a computer so that I could see it working. As the blue printout as seen was not good enough, and the black ink was not to be seen, I came away without a printer.

I think that shops are taking a casual view of the customer, riding on the crest of a wave of sales. Maybe they feel that there is no need to bother with demonstrations. Considering the price of even the cheapest printer, it seems odd that they don't make a bit more effort, shoe shops take a lot more trouble to sell a much less expensive product.

Bill Robinson, Dawlish, Devon.

Printing at midnight

I AM writing to say how I feel about the Beyond Software **Lords of Midnight** competition. I for one can complete the game but have no printer, and cannot enter. It annoys me greatly that a printer is necessary to enter the competition because it means spending more than the £9.95 that the game costs.

Gareth Layzell, Stanmore, Middlesex.

● *Many readers have complaints of a similar nature. Beyond Software be warned!*

Fanfare for the ZX-81

RICHARD Brooker — November — is right to ask for more ZX-81 cover in *Sinclair User*. I believe it is important that you do more for users of this excellent little computer — and always bear in mind that it is still selling.

Furthermore I would like to make a point about your software reviews. It could be that you underate some of the programs for ZX-81 thereby dissuading potential buyers. For example, I thoroughly enjoy playing **Racing League,** a strategic game concerning the Sport of Kings. Your review said the game was 'slow'. Even the highly successful **Football Manager** — Gilbert Factor only 7! — is slow on the ZX-81 but it remains a great game!

T G Bell, Winlaton, Tyne and Wear.

● *Racing League was described as slow because the bulk of it was written in Basic, not machine code.*

Speechless Spectrums

I RECENTLY made a speech synthesiser unit which operates quite well on my 48K Spectrum. Unfortunately, it suffers from a limited vocabulary. It operates on the Allophone system from the SP0256-AL2.

I would appreciate information on how I may obtain words together with their Allophone equivalents from other readers.

Declan Grady, Cullion Road, Letterkenny, Co. Donegal.

C64 slips past censors?

I FEEL that I must write and express my deep disappointment and annoyance at finding a Commodore advertisement in the October issue. It may have escaped your notice but your magazine is called *Sinclair User!*

If you keep this up you will have lost one loyal customer.

J S Shaw, Blackfield, Southampton.

● *Rob Cameron, advertisement manager replies: In the long run it is product quality and service which counts and if Sinclair's rivals feel they can do better who are we to censor them from saying so?*

50 of the best?

YOUR TOP 50 Software Classics — November, *Sinclair User* — is a classic example of the way your magazine seems to be heading. One war game mentioned, no management or strategy games that I could see. I know you have reviewed such games as **Conquest** and **Fall of Rome** but can you do more?

Peter J Beard, Market Rasen, Lincolnshire.

I MUST congratulate you on your excellent magazine, it goes from strength to strength. November's issue must have been the largest yet and the top 50 games booklet was a great bonus. However, I was amazed that **Scuba Diver** by Durrell wasn't included. It has to be one of the most addictive and graphically superior games around.

John Meads, Rainham, Kent.

Programming for more cash

A FEW errors have crept into program listings of late, for which we do apologise. **Domewars,** in the November issue, should be amended as follows:

Line 340 should read:
PRINT AT 19,3; INK 6;"*"; INK 5;"+";AT 20,3; INK 7;"."; INK 3;"/"

We should also point that the program does not use User-defined Graphics in the conventional sense, but changes the character set instead. That appears to have confused some readers.

Home Accounts in the November issue is lacking a few lines of the last DATA statement. It should read:

```
9800 DATA
"a",10,"b",1000,
"c",2000,"d",3000,
"e",8900,"f",8950,
"g",8980,"h",8990,
"A",10,"B",1000,
"C",2000,"D",3000,
"E",8900,"F",8950,
"G",8980,"H",8990.
```

In Home Accounts, the bank statement section is there purely for reference and will not be used by the monthly forecast.

Finally, **The Right Stuff** in the October issue also suffered from gremlins. Make the following amendments:

```
1 GOTO 500
479 IF q hi THEN GO TO
    9301
507 RUN 600
630 FOR f=0 TO 7
9234 LET q=hi
```

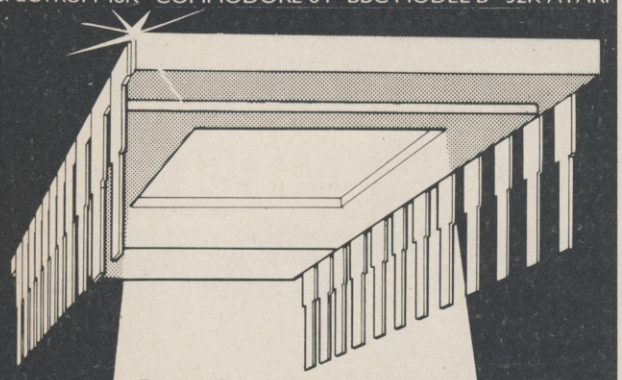
Now for the good news. From now on we shall be paying £20 for each program published, and £50 for star programs. Details of how to send programs can be found on the Contents page. Please make sure that your programs are accompanied by a letter describing the game, your name and address, and a cassette or cartridge containing the program.

We try our best to send back programs we cannot publish as quickly as possible, and will make special efforts with cartridges.

The Complete

Machine Code Tutor

SPECTRUM 48K · COMMODORE 64 · BBC MODEL B · 32K ATARI



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Crash"

"By far the best attempt comes from New Generation Software who has recently issued its Complete Machine Code Tutor for the BBC and the Spectrum.
Popular Computing Weekly"

"New Generation have got a very nice product here. It's well thought out, easy to use, aesthetically pleasing, and (as far as I could tell) bug-free and crash-proof" . . . "Overall then, an excellent idea, well executed.
Computing Today"

Supplied with full notes, this package teaches machine code the way it should be taught – at your own pace and actually from the microcomputer, not from a book. You learn programming the professional way, plus a few tricks of the trade. Available from all good computer stores at £14.95.

GSH

New Generation products are sold according to their terms of trade and conditions of sale.

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Selected titles of New Generation Software are available from your local computer store and larger branches of: WHSMITH · John Menzies · WOOLWORTH · Spectrum · Boots

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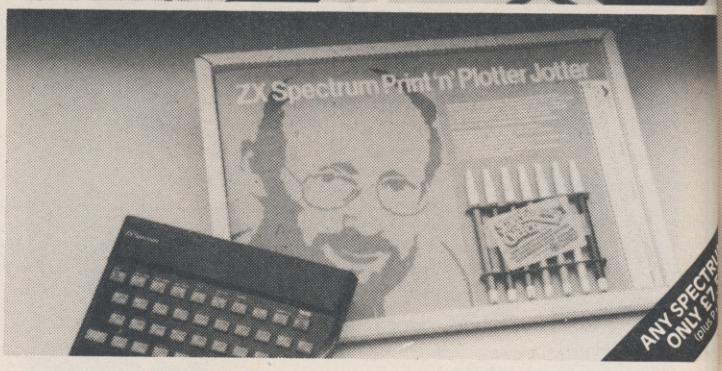

PAINTBOX

Superb Graphics — without expensive hardware!

PAINTBOX is a must for every owner of a 48K Spectrum.

It will give you the ability to produce stunning graphics on your micro — simply.

With PAINTBOX there's no need for expensive hardware — why pay up to £150 for hardware when you can produce incredible picture and graphics with one cassette-based software package?

If you haven't seen PAINTBOX demonstrated you're in for a pleasant surprise!

For instance, PAINTBOX will enable you to draw practically anything on your screen and save it either as SCREEN$ or as a machine code memory file to use in your BASIC or MC programs.

You wield enormous power over the graphics capability of your SPECTRUM — including the definition, storage and use of up to 84 UDG's — 4 times more than normal! A brief description of facilities are as follows:

UDG DRAWING BOARD for defining up to 4 Banks of UDG's including ROTATE, MIRROR, INVERSE etc.

UDG EDITOR for storing up to 84 UDG's for use in screen planning or in your other programs.

PRECISION PLOTTER. A high-resolution drawing board which allows you to draw anything on the screen. Facilities like CIRCLE, FILL, ARC, PLOT, DRAW, ERASE, OVER, DRAW RADIALLY, INK, BRIGHT etc are included and easy to use!

SCREEN PLANNER gives you the best of both worlds! The combined use of PRECISION PLOTTER and your Banks of UDG's for highly detailed and precise screen graphics.

The program is complete with DEMO on side two of the cassette and a 28 page instruction booklet.

PAINTBOX can be used with Joysticks and is Sinclair Microdrive compatible.

SCREEN MACHINE

Instant Machine Code for graphics and text

SCREEN MACHINE is a completely professional graphics utility to use with Paintbox (or any other graphics hardware or software).

It will allow you to manipulate your screen graphics and text in ways which will make your programs better and more memory efficient. For instance:

If you have produced a screen-full of superb graphics you can enlarge, reduce, recolour, flip screen, relocate your graphics to another part of the screen, superimpose one screen on another and perform all sorts of other wonders!

Then you can take your results and put them through a series of memory compression routines to allow you to save enormous amounts of memory. Such items like compressing with or without attributes, saving thirds of the screen and multiple combinations of both are possible.

Never has machine code storage of graphics been simpler because SCREEN MACHINE automatically creates re-callable multiple screen files with a location catalogue so that you can add them to your programs!

SCREEN MACHINE also allows the user to program UDG's or text directly into machine code, so if your programs use a lot of text instructions or menus SCREEN MACHINE is going to save fantastic amounts of memory!

SCREEN MACHINE is a major graphics toolkit for the 48K SPECTRUM. It is completely menu-driven, Sinclair Microdrive compatible, and comes with instruction book and an unbelievable DEMO on side 2 of the cassette.

ADVENTURE PLANNER

A must for the adventure game fan

If you're an Adventure Game nut, Print 'n' Plotter's new ADVENTURE PLANNER is exactly what you have been looking for!

It's a 50 page, BIG SIZE (16¾" x 11¾") pad with a complete 'mapping' system with over 150 locations on each sheet . . . created to help you solve Adventure Games.

It's the best way to beat the 'system' and is obviously for use with any make of computer.

ADVENTURE PLANNER will also assist you in planning Adventure Games for programming — a helpful pad to keep by your computer at all times.

TO IMPROVE PROGRAMS.

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ADVENTURE PLANNER is a high quality pad, board-backed and fly-leaf cover . . . economically priced too!

ZX SPECTRUM JOTTER

Pre-planning your screen made easy . . . and precise!

Print 'n' Plotter JOTTERS have become a household word for the Sinclair enthusiast.

Despite various imitations our original ZX SPECTRUM JOTTER is still the one people prefer!

Of course it could be because it is professionally produced . . . the quality is superb.

And the fact that it is BIG SIZE A3 (16½" x 11¾") is a distinct advantage when working in high-resolution.

It's also 100 pages thick. 50 pages of PLOT grids showing each numbered pixel co-ordinate and 50 pages of PRINT grids showing every character and graphic character position and INPUT lines.

Each page also contains 24 UDG planning grids (2400 per pad).

Consider also the fact that it is printed on Artist's Detail paper . . . thick enough to take any writing, drawing or colouring, yet thin enough to overlay onto a drawing and trace-off.

For pre-planning graphics, text, tabulation or anything to produce 'on screen', a Print 'n' Plotter JOTTER won't be beaten.

The complete package comes with a set of coloured pens, a Pixel ruler and a handy corrugated storage tray.

If you use PAINTBOX, SCREEN MACHINE or any other graphics utility . . . you'll do things better with the ORIGINAL Print 'n' Plotter JOTTER!

KEYBOARD OVERLAYS

The simple answer to "Which key?"

Print 'n' Plotter KEYBOARD OVERLAYS for the standard ZX Spectrum keyboard are the economic answer to "Which key does what?"

If you program, or buy commercially-produced software, sooner or later you'll be faced with a mind-boggling mass of keys that perform different functions.

Let's face it, the Spectrum keyboard is complicated enough so why not take the easy way to remember . . .

. . . lay over the keyboard a Print 'n' Plotter OVERLAY and write the function underneath . . . it's child's play!

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S12

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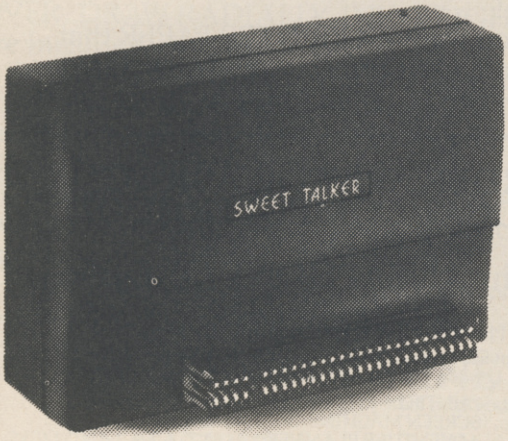

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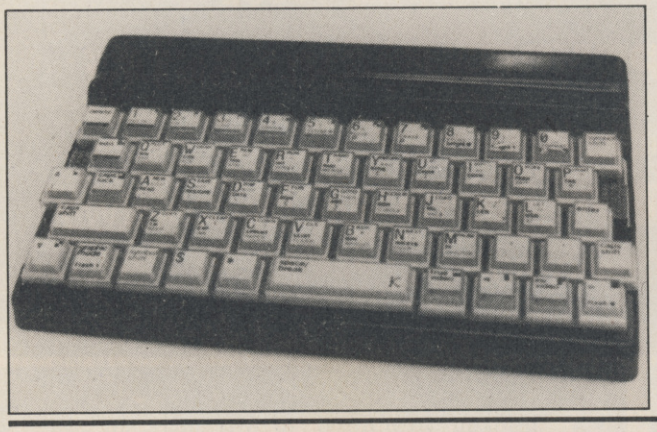
Transparently tacky

THE replacement keyboard for the Spectrum from Kappa Keyboards is a curious mixture of new and old ideas. It uses a style of key that was popular among DIY enthusiasts a few years ago and yet it has 14 single key functions, a recent innovation in keyboard design.

The keycaps are of transparent plastic and you are supplied with a sheet of paper on which the legends are printed. That has to be cut up and the legends placed under the caps.

The extra single key functions are Edit, Delete, Comma, Full Stop, Dollar, Times, Graphics Mode and Caps Lock which toggle on and off, four shifted Cursor keys and True and Inverse Video. The last six are particularly useful with **Tasword II,** using the cursor keys to move around the text and the video keys to move one word at a time — an idea reproduced on the new Spectrum+. In addition there are extra Caps Shift and Symbol Shift keys, but, there is no E Mode key, a major omission.



It is supplied as a replacement for the top half of the Spectrum. You remove the five screws holding the Spectrum together, disconnect the keyboard leads, insert the new leads and screw the case back together. The new leads are, unusually, ribbon cable with half the insulation removed, and so they will not stand repeated insertion.

With all the extra keys and the limited space available the keyboard is very cramped. Despite that Kappa still manages to find space to bring the Address and Data lines to the top of the keyboard via two IC sockets placed either side of the keys. The company sells an additional adapter which converts them to take a joystick. The left hand socket simulates 1, 2, 3, 4 and 5 and the right hand one 6, 7, 8, 9 and 0, as used on Interface 2.

For £48.00 the keyboard has much to offer in faciliites but it falls down badly in key layout, feel and looks. If it used better keys and was housed in a bigger case then it would be one of the best keyboards on the market.

There may be, however, a solution to the problem. Kappa can also supply a small electrical package at £14.00 to which you can wire your own keys. That allows you to have functions which normally require a shift key to be replaced by a single key.

Further details of those products can be obtained from Kappa Keyboards, 14 Pauls Mead, Portland, Dorset DT5 1JZ.

New COPY causes corruption

A NEW full-sized Centronics printer interface for the Spectrum has been launched by Cambridge Microelectronics Ltd. Called the Print-SP it allows the user to redirect the LPRINT and LLIST commands to the printer or to copy the screen.

As with many of the popular printer interfaces the software needed to run it is supplied on tape. That sits in the now unused printer buffer which has the advantage that it is compatible with software which uses memory above RAMTOP. It also has the disadvantage that NEW or COPY will delete it.

The software can be configured to give up to 80 characters per line and to give an automatic Line Feed (LF) after a Carriage Return (CR). The COPY routine can be configured for the Epson and Seikosha 100/250 types of printer and is called by a RAND USR call.

Also supplied on the tape is a text processor program called SPWRITE. This is a Basic program which effectively DIMs an array of up to 500 by 64 characters and then allows you to fill each element.

On the plus side the interface is inexpensive at £31.25 including cable and, due to the case design, is easily fitted to a full-sized keyboard. However, it does not have a through connector for other add-ons and there are many programs, such as **Tasword II,** which use the printer buffer making it incompatible. If Camel was to include software which sat above RAMTOP and dispensed with SPWRITE, which is of limited use then the interface would be a good buy. As it stands there is little to set it apart from the others on the market.

The Print-SP is available from Cambridge Microelectronics Ltd, One Milton Road, Cambridge CB4 1UY.

Spectrum switch

THE BEST things arrive in small packages and the Spectrum Switch from TEC is one of the smallest pieces of hardware we have had to review. It is an on/off switch which fits into the power socket of the Spectrum. The lead from the power supply plugs into the back, and there is a small rocker switch on the front. The unit is held in place by double sided tape.

It is a good idea to have some form of switch on the power supply as repeatedly pulling the plug will eventually weaken the socket. The Spectrum Switch is pleasantly styled and, provided the Spectrum is still in the original case, a useful addition.

The only problem is the price. While the cost of the component parts is reflected in the price of £4.95, if you are able to use a screwdriver you could add your own in-line switch for a fraction of the price. If you would rather take the easy way out the Switch is available from TEC, 24 Victoria Road, Bromsgrove, Worcs.

more hardware on page 27

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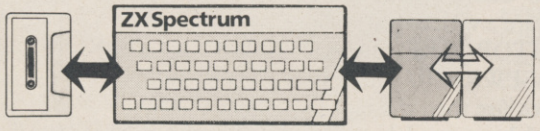

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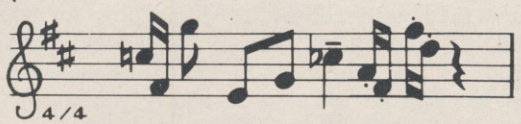

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Compatibility cure

AFTER a slight hiccup AGF has now relaunched its Protocol 4 progammable joystick interface for the Spectrum. The original version was not compatible with all Kempston compatible games but that has now been cured.

A novel method is used to program the interface. You are supplied with five small plastic cards, four of which are already set up. Those cards contain a series of holes which represent the Address and Data lines as used by the Spectrum keyboard. Small rubberised pads are then inserted in the holes, one per line per key, according to a chart supplied, until the four directions, and fire, have been programmed.

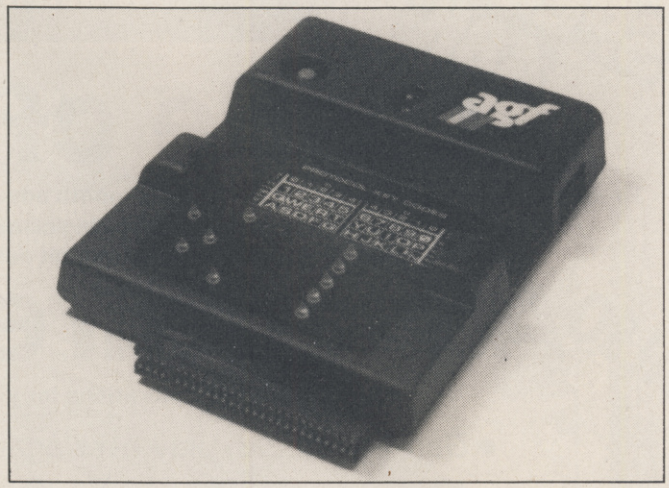
The card is then inserted in the interface so that the rubber pads press down in a membrane, similar to that used on the Spectrum keyboard. The four preprogrammed cards simulate the 5, 6, 7, 8 and 0 keys, the 1, 2, 3, 4 and 5 or 6, 7, 8, 9 and 0 Interface 2 keys. The remaining card simulates the Kempston standard.

That process may appear rather complicated but it only has to be done once. AGF supply ten reference cards on which you can note the positions of the rubber pads and can supply additional plastic cards so you can keep a stock of preprogrammable cards. The cards can be changed while a program is running, if you are careful not to joggle the interface, and the keyboard is not disabled.

On the pre-production version tested, the expansion port had not been carried through to the back of the interface, but AGF plans to do that on later models. It did have a useful reset button on the top of the interface and the ability to use joysticks with the Auto-Rapid Fire feature.

There are, however, some reservations about the interface. A membrane has a limited life. Also the cards sometimes fail to locate properly so that only two of the four directions worked. That could be cured by being heavy-handed when inserting them but should not be necessary. The greatest problem is the speed of response. When the keyboard is simulated there is a delay between moving the stick and something happening. When playing a game that could mean the difference between getting zapped or living to fight another day.

Overall, the interface has much to offer but fails to deliver. For more details contact AGF, 26 Van Gogh Place, Bognor Regis, West Sussex PO22 9BY.

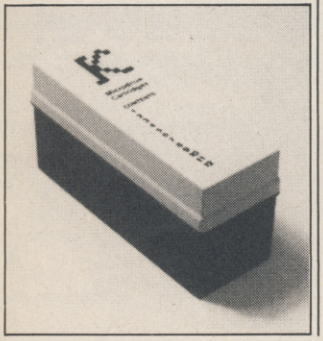


Boxing clever

REGULAR readers of the computer press may remember a bright idea sent in by a reader some time ago for storing microdrive cartridges. He suggested that some types of photographic slide boxes were just the right size to hold a dozen cartridges.

Not the sort of people to let a good idea go to waste, Kappa Keyboards, whose address is given elsewhere in Hardware World, obtained some slide boxes, printed its logo and an index on the top, and the Kappa Keyboards Cartridge Box was born. For £0.99 you get just that — a slide box with a printed lid.

If, however, you do not want the printing and only want to spend a fraction of that amount then contact your nearest photographic stockist.



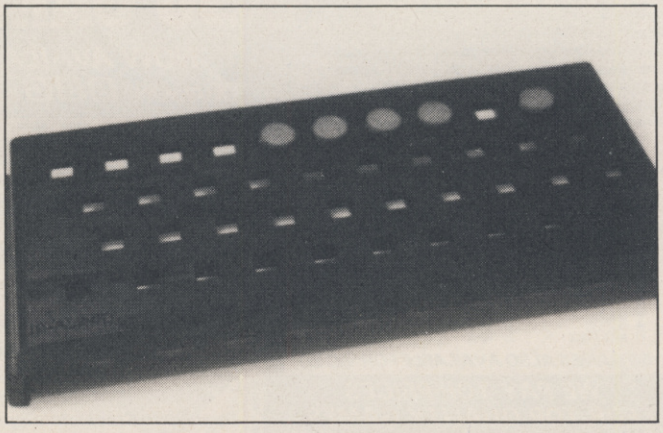
Plug for memory pegs

ONE of the more unusual add-ons for the Spectrum is the Games Board from Marvic Marketing. This is a well made plastic cover which neatly clips over the keyboard with holes over all the keys. Pegs can then be inserted in the holes which, when pressed, press down on the key underneath.

The idea behind it is that if you put pegs over the only keys you need to play a particular game then you cannot inadvertently press the incorrect key, or forget which keys you are supposed to be using. To help you in that you are also supplied with sticky labels to put on the pegs with such useful legends as Bomb, Laser, Start, Pause, Hyper and Fire as well as a number of arrows to indicate direction.

If you are completely absent-minded then this is the add-on for you. If not then save your money and buy a joystick.

The Games Board is priced at £9.95, from Marvic Marketing, Arndale Centre, Stretford, Manchester M32 9BB.



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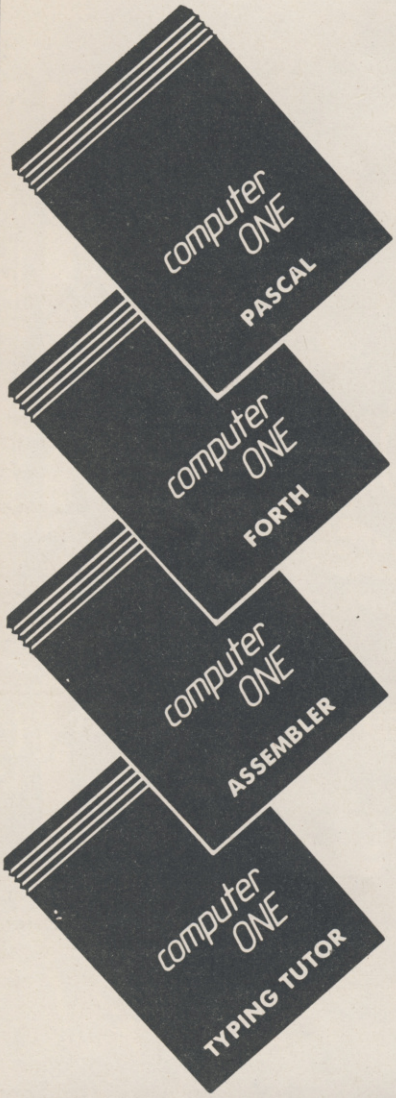

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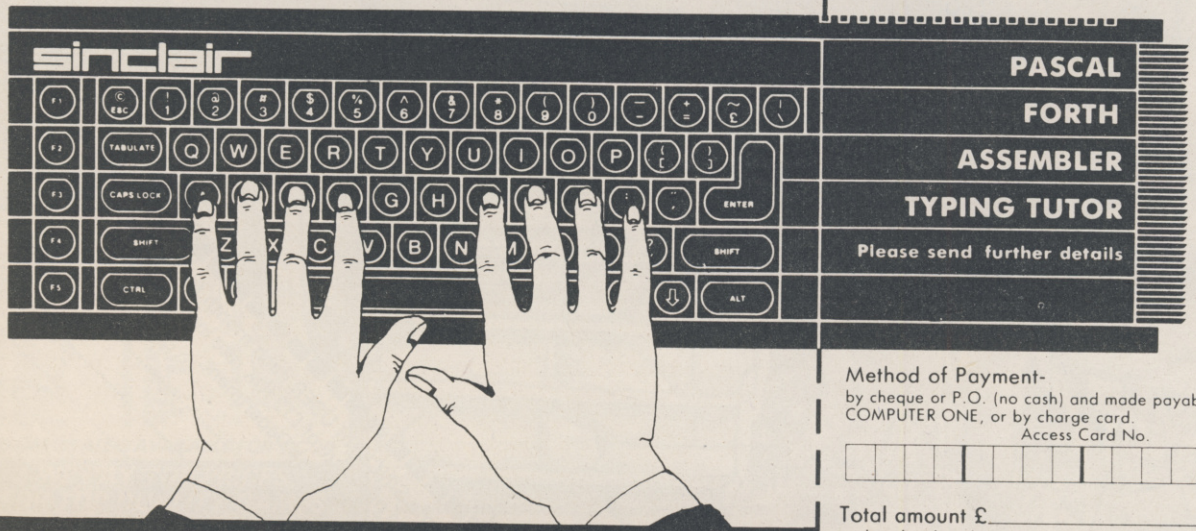

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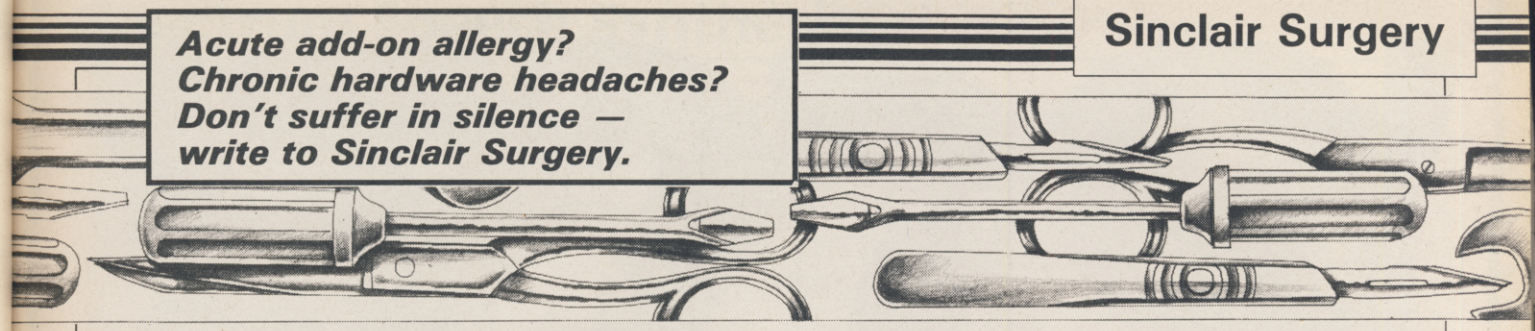

Acute add-on allergy?
Chronic hardware headaches?
Don't suffer in silence — write to Sinclair Surgery.

Readers' feedback on crash prevention

THE OCTOBER issue of Sinclair Surgery provoked a number of readers to write in with useful hints. Most concerned ways of stopping the computer crashing if an add-on was joggled. Charles Rowbottom of Arnside, Cumbria suggested cleaning the edge connector with Switch Cleaning Fluid, while W R Corbett of Wigan had a useful POKE for Spectrum owners. He believes crashing is caused by the NMI line being disturbed which can be cured by POKE 23728,1. That is a new one to us but if it works then the best of luck to you.

Charles also pointed out that a Stereo tape deck can be used provided that both channels are used for recording and playback. If you do this you must make sure that you do not leave the EAR lead in while saving otherwise the feedback could do nasty, expensive things to your deck.

If you have any comments regarding our replies or tips of your own then let us know. You could save someone a few sleepless nights.

Sticky problems

I HAVE a complaint. Why do a lot of the Spectrum keyboards come away from the computer. That has happened to the computers of my friends and is beginning to happen to mine. What should I do about this?

David Lyall,
Moary, Scotland.

● *The part that is coming unstuck is simply the metal cover plate on which the legends are printed, which fits over the rubber key mat. That was a common problem with early Spectrums until, after a number of complaints, Sinclair changed the glue for one that did not melt due to the heat. The solution is to simply glue it back into place with a suitable glue.*

Racing wheels

CAN you answer a question concerning **Chequered Flag** from Psion? I have heard that a steering wheel was available with early copies to promote sales.

Carl Ritchie,
North Harrow,
Middlesex.

● *The only steering wheel we know of was produced by Spirit Software, 1 Pembroke Mews, London W8, in conjunction with its Formula One racing game. We have never seen one of those wheels but would be happy to hear from readers, or Spirit Software, if it is still available.*

Sickly sticks

I RECENTLY purchased a Ram Turbo Interface and a Quickshot II joystick. A problem has occurred. Frequently the joystick will not respond to upward movement; I usually have to adjust the joystick cable and sometimes it will work. I am unable to return both items as I purchased them in Boots in Liverpool.

Rory Canavan,
Bray, County Wicklow,
Ireland.

● *If something you have bought does not work then the only answer is to send it back. It should be possible to exchange it through your local branch of Boots.*

Continuous firing

OWNING a 48K Spectrum, I now wish to purchase the Quickshot II joystick with the auto-fire feature. I wonder if you could advise me on which programmable interface to buy as some of them crash if you use this joystick. I cannot afford more than £30.00.

Mark Wright,
Rugby,
Warwickshire.

● *This month in Hardware World we review the AGF Protocol 4 joystick interface. As far as we know that is the only interface which allows you to use the features of a standard Auto-Fire joystick and is priced at £29.95.*

Solder onwards

STEPHEN Neal, November Sinclair Surgery, had a problem with his keyboard. The information you gave to him was correct, but it was not practical. I would bet that the problem lies in the cheap ribbon cable in the Spectrum. I can't really see the matrix giving up the ghost, not unless the user is hamfisted.

If you're handy with a soldering iron read on.

Carefully open the Spectrum to reveal the ribbon cables. Pull them out of the sockets. Unscrew the circuit board from the base.

With a suitable desoldering tool take out one of the two ribbon cable sockets. Solder one end of a new piece of flexible ribbon cable into the circuit board at the same place where the socket came from. Then solder the socket to the other end of the ribbon cable.

With a pair of scissors, cut back the original cable so there is a kink-free length of cable to slide into the socket.

Do the same thing to the other cable if needed if not, make sure that there are no shorts when the computer is put together again.

Wasn't that nice and simple?

Brian St Rose,
Ilford,
Essex.

● *This is correct if you know what you are doing but we would not recommend that a novice attempt to solder anything to the Spectrum circuit board.*

Addressing bytes

WITH reference to your November issue I was a little surprised to read the advice you gave to D Williams and to Carl Williams concerning their problems as I would have thought that the cause of D Williams' problem, in particular, was pretty obvious. He or she was trying to dimension a numeric array, A(4000) on a ZX-81 with a 16K Rampack. Numeric variables — as nearly every schoolboy knows — require five bytes for each address in the array. Thus 4000=20K which will not go into any 16K RAM.

I regret that the advice which you gave Carl Williams was also slightly adrift. A file can be moved directly from one microdrive to another using the MOVE command.

John Hale,
Newport Pagnell,
Buckinghamshire.

'PSST!

...ELLO JON GOTTA NEW COMPUTA'

Games Extra

So now you've got a new Commodore computer what are you going to do with it? We have the answer and it won't cost you a penny.

The January edition of COMMODORE USER has a FREE 36 page Games Extra. It contains six super listings for the 64, many written by professional authors for companies like Melbourne House and McGraw Hill. Shiver in Dracula's Nightmare, discover the North-West Passage in Francis Drake's Adventure or dodge the avalanche in Everest.

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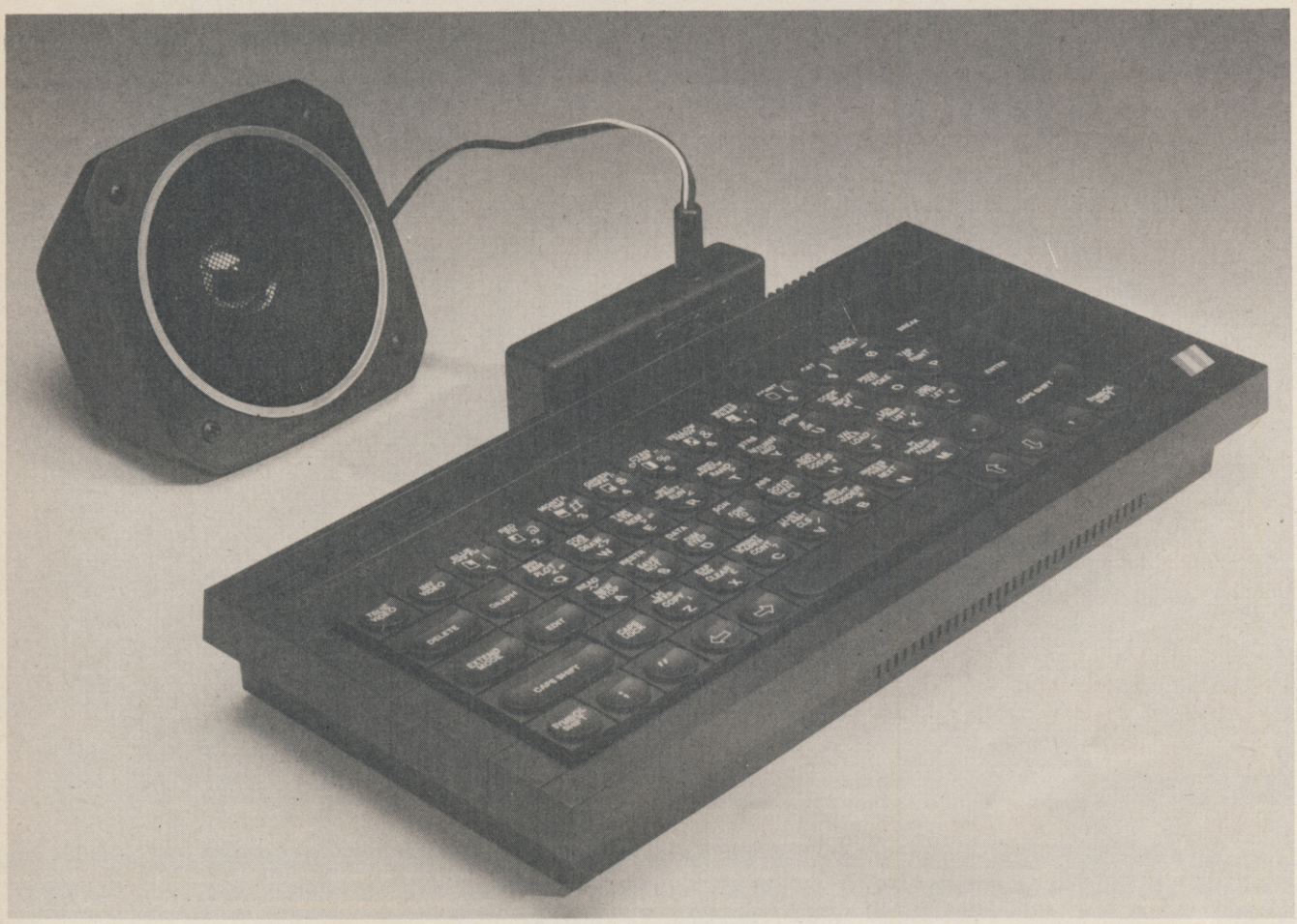
COMMODORE user

Spectrum Speech Synthesizer!

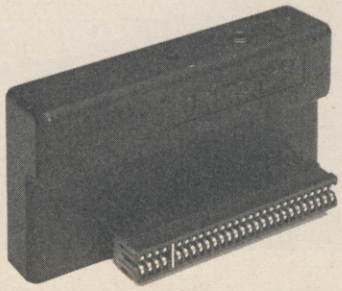


The dk'tronics synthesizer, like all their other peripherals is both Spectrum & Spectrum plus compatible, it uses the popular SLO/256 speech chip and has an almost infinite vocabulary. It is supplied with a text to speech converter for ease of speech output creation. Everything you wish to be spoken is entered in normal English, without special control codes or characters, it is therefore extremely easy to use. The voicing of the words is completely user transparent and the computer can carry on its normal running of a program while the speech chip is talking.

Although there are only 26 letters in the alphabet, letters have a totally different sound when used in different words. For example, The ''a'' in Hay is much longer and softer than in Hat. When you speak you automatically make adjustments because you know just how a word should sound. Not quite so easy with a computer. After looking at other speech synthesizers we decided that it was essential that the dk'tronics Spectrum Speech would offer a simple system that would enable the user to produce realistic speech that was instantly recognisable.

The solution to the problem was extremely complicated, it required hours of programming to enable the computer to look at the individual letters that make up each word and compare there relative position to each other before deciding on the appropriate sound.

I am delighted that we have now perfected what I consider to be the best Spectrum Speech Synthesizer on the market, one which has achieved my aim, within the limitations of the allophones, of producing realistic speech.



At **only £24.95** the dk'tronics speech synthesizer represents remarkable value for money. Naturally it is compatible with their other peripherals which can be used via the rear through connector.

Available from department stores and good computer shops everywhere or direct from

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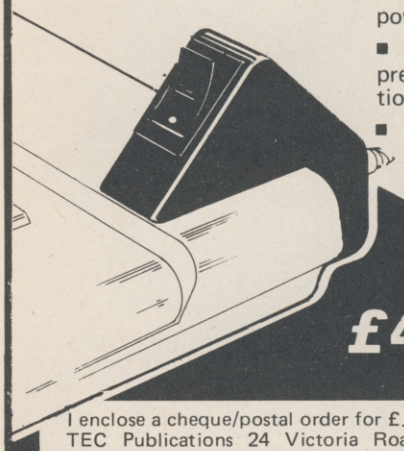

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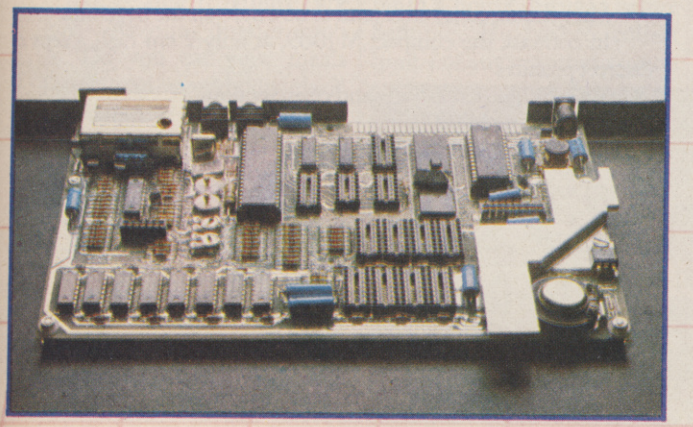

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Here comes the chopper!

THE VIOLENT scenario of **TLL** has been replaced by an altogether more humanitarian mission in the sequel, **Cyclone.** Rather than provide you with a swing-wing Tornado, Vortex has obtained a nippy little helicopter, and your task is not to bomb the bases but collect vital medical supplies in the face of a colossal hurricane.

The playing area is large, an expanse of ocean dotted with islands which are being evacuated. A map option shows the overall picture, and charts the centre of the cyclone, which can move around with frightening speed.

While the graphics are based firmly on the very successful TLL, with 3D-style landscapes and small houses, they are not as pleasing to the eye. The game has several new factors which, however, more than make up for the deficiency.

There is more animation; villagers on the islands wave at you, and the helicopter has a hook and line with which to winch up the crates of supplies. The rugged terrain of the islands may cause you to crash, but far more dangerous are the other aircraft on the flight lanes between the islands, and the cyclone itself. While producing no apparent effect on the landscape, if you stray too close to the epicentre it will buffet you this way and that. You will be lucky to escape with your life, let alone with sufficient fuel to make it to a landing pad.

An extra bonus is the option to view the landscape from both North and South. The crates of supplies will only be visible from one direction, so you must explore the coastline carefully to find the boxes. The minute danger threatens it is all too easy to forget which way you are heading and fly straight into the eye of the storm.

While offering less opportunity for flashy aerobatics than its predecessor, Cyclone presents more problems and is more satisfying to play. The graphics are still effective, if less complex, and the concept of battling against the weather as well as your own cackhandedness is novel and welcome. *Chris Bourne*

CYCLONE
Memory: **48K**
Price: **£6.95**
Joystick: **Sinclair, Kempston, Protek**
Gilbert factor: **8**

Eysenck, the shrink

PROFESSOR Hans Eysenck is one of the gurus of modern psychology, renowned for outspoken and often controversial views on the nature of human thought.

His recent book of personality tests, published by Penguin, became a minor bestseller, and the tests have now been released in the form of a computer program.

It must be emphasised that the tests are not supposed to have any clinical value, but are simply an entertaining questionnaire of the type that appears in glossy magazines, but glorified by the authority of the good professor.

The questions include all the things that you might expect, such as 'Have you ever wished you were dead?' or 'Do you feel you are a failure?'. In amongst these depressing interrogations are more intriguing queries, such as 'Do you eat your meals faster than everybody else?' or 'Would you like to watch a pornographic movie?'

Each test comprises about 200 questions. There is a facility to SAVE the data from each completed test so as to produce a grand display of all your faults and virtues in one soul-destroying blitz.

Taken as entertainment, which is Mirrorsoft's purpose in releasing the program, **Know Your Own Personality** is good enough fun. One should not, however, believe everything the program says. Eysenck may be a leading authority, but even he cannot be expected to get it right with a silicon cushion between him and his patient. *Chris Bourne*

KNOW YOUR OWN PERSONALITY
Memory: **48K**
Price: **£9.95**
Gilbert Factor: **6**

On a level with Ted

CHIPS, chips, everywhere and not a bite to eat. After all, who wants to eat the silicon variety?

Hewson Consultants obviously believe someone might like a byte and have launched **Technician Ted.** It is yet another platform game bearing startling similarities to **Jet Set Willy.**

You play the part of Ted in a silicon chip factory. It is a massive place and to get his meal of chips, Ted has to complete various tasks allowing him to pick up a glass, knife and fork and so on.

The graphics are highly coloured and scroll smoothly — transition from one screen to another is well oiled! Ted almost waltzes round the factory to the *Blue Danube,* a rousing number even when played on the Spectrum.

Technician Ted is guaranteed to keep avid arcade adventurers happy for a few days. However, if you prefer something with more zap, don't go anywhere near the silicon factory. *Clare Edgeley*

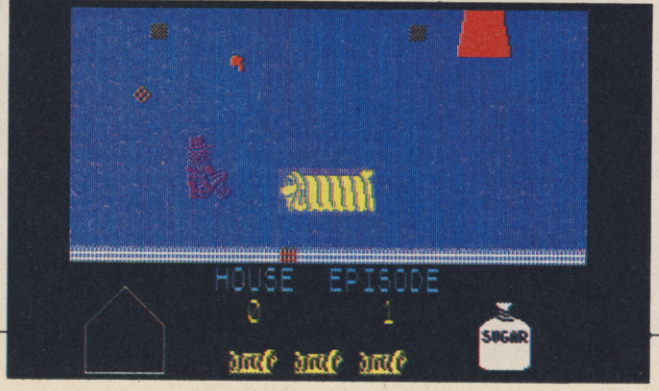
TECHNICIAN TED
Memory: **48K**
Price: **£5.95**
Joystick: **Sinclair, Kempston**
Gilbert factor: **7**

Time for bed, said Zebedee

IN **The Magic Roundabout,** from CRL, Dougal and the gang are still playing happily in the Magic Garden where Dougal's aim is to build a house of sugar before bedtime. He has to collect lumps of sugar dotted around the garden and dump them at the Magic Mushroom — resembling a deformed flower — where a train will appear to transport them to his house.

Sprite characters make up the graphics and although they are a faithful copy of the original characters the movements are jerky and slow.

Not a game to start the adrenalin flowing — in fact it will continue to course sluggishly through your veins — it is great nevertheless to see that Dougal and friends are still around, even if they have been incarcerated in RAM for posterity. *Clare Edgeley*



MAGIC ROUNDABOUT
Memory: **48K**
Price: **£6.95**
Joystick: **Protek, Kempston, AGF**
Gilbert Factor: **5**

more software on page 38

The tales of Viking Eric

BASED on the book by Terry Jones, **Erik the Viking,** although published by Mosaic, has been programmed by Level 9. The adventure does not simply rehash the original but uses extracts from it to provide background and clues for a new saga.

Erik has settled down to become a prosperous farmer. While his sons go a-viking in the summers he prefers to sit by his hall fire and hear their tales. His contentment is short-lived and one day, as he snoozes under a tree out on his pastures, his farm is raided by strange creatures from the outlands. He wakes to find his family and wealth have been taken.

The game begins at this point and Erik's task is to get his ship and crew together and then head down the fjord to the open sea. Appalling danger and powerful magic await him.

The program is attractively presented and the location graphics are well made, giving a fair flavour of the period. They take a little time to draw but can be removed by entering 'words'. The scenario is imaginative and full of event. There are enchanters, goddesses, sea monsters and vicious enemies.

The puzzles appear to be quite complex, as we might expect from Level 9, and Erik's journey is full of choice and decision. Even setting off requires a lot of forward planning.

The interpreter does not seem to have suffered too badly from the space given over to graphics though there were times when it could have been more helpful. In general, though, Erik the Viking is entertaining, complex and very good to look at. Even with a few minor criticisms Level 9 games are well above the normal standard of most adventures and this one is no exception, a blend of heroic adventure and detective story. *Richard Price*

ERIK THE VIKING
Memory: **48K**
Price: **£9.95**
Gilbert Factor: **8**

The flight of the BMX biker

EDDIE KIDD may have found it a doddle jumping 14 buses but in **Jump Challenge** it is not so easy.

In the official Eddie Kidd version from Martech Games, you are given the chance to beat Eddie's world record jump — secure in the knowledge that every time you fail your bones remain intact.

Pedalling furiously on your BMX, you warm up with a gentle jump over a mere 18 oil drums. It is quite easy — complacency sets in.

On graduating to motor bikes there is a relatively small jump over eight cars for starters! If, as the instructions state, you land with your back wheel on the ramp you should be all right.

The game calls for a large combination of skill, luck and the ability to judge speeds and distances. The speedometer and rev counter are a help but the main idea of the game is to teach the player to 'get the feel' of the bike.

The position of the rider is critical during the flight as he controls the angle of the bike. Making him lean backwards or forwards alters the bike's trajectory so that a safe landing can be negotiated. You will need to put in a lot of practice to get it right.

The game is well written and includes all the elements of skill and coordination that make an exciting program. There is one irritating aspect. If you repeatedly fail to clear the eight car stage, the game will end and start again with the BMX warm-up. When you are itching to get Eddie into the air, that stage seems a waste of time. *Clare Edgeley*

JUMP CHALLENGE
Memory: **48K**
Price: **£6.95**
Joystick: **Not specified**
Gilbert Factor: **6**

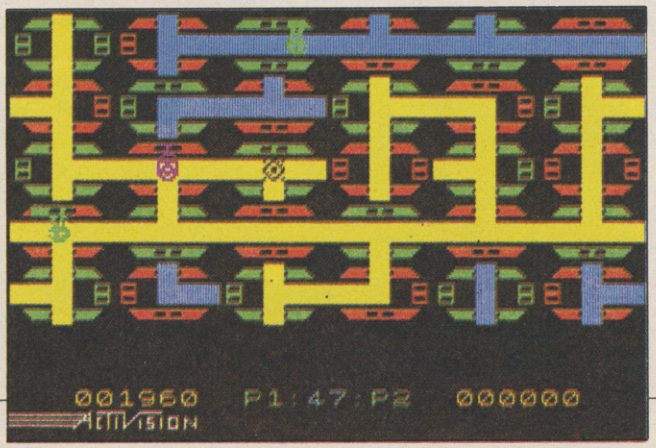
At one with the elements

ZENJI is a strange game but one which has become a cult in the United States. It is an Activision import which has been hurriedly translated to the Spectrum.

In order to become a master you must rely on your intuition to feel the forces flowing through the game's maze. Your playing piece is a face which revolves as you move the joystick or the keypad defined on the keyboard.

It starts at a central element and you must move it round the corridors and connect it to other elements which lie at the nodes of the corridors. If you hit a connection then a power wave is started between the original and new element and a link established. Part of the maze lights up with the radiance that those sources give off.

The higher levels of the game involves mazes which fill the whole screen and creatures which will only be too happy to feed on the energy that propels your character. If you bump into one then you will lose a life.



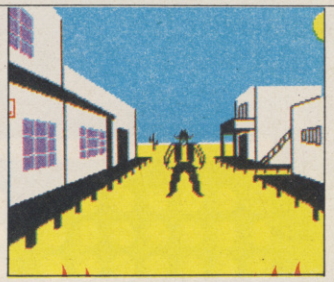
You will find that you will get better at the game and reach the higher levels but in **Zenji** experience is gained through insight and not mental reasoning. There is a way to beat the game at all its levels using logic but that spoils the excitement and we do not intend to reveal the answer.

Ultimately, Zenji is a test for two players. When you have enough mastery over the mazes then you should find a friend to pit your wits against.

John Gilbert

ZENJI
Memory: **48K**
Price: **£7.99**
Joystick: **Programmable, Sinclair, Kempston, Cursor**
Gilbert Factor: **8**

Bargains are bootyful



IN A BID to capitalise on the computer gaming scene, British Telecom has recently entered the market with their Silver range of games — priced at £2.50.

They are a mixed bag. BT's claim that the games are worthy of a five pound price tag seems to be applicable to only two of the games reviewed here. The remaining two would be expensive at any price over £2.50.

In **Booty,** you play the part of Jim the Cabin Boy who finds himself aboard the infamous pirate ship — the Black Galleon. One night while most of the pirates are sitting down to a steady drinking spree Jim creeps round the levels of the ship to steal their loot.

However, life is not always a game and Jim finds himself in the suds when he realises that not all the pirates are drunk — some have been left on guard. To get into their cabins, he has to steal the keys from under their noses.

The graphics are excellent with half the game portrayed in the increasingly popular style reminiscent of **Sabre Wulf** and **Pyjamarama.**

Viking Raiders is a different kettle of fish. It is a strategy game set amongst warfaring vikings back in the days of King Canute.

There are four armies, each headed by a Viking chief. The aim is to defeat the other three armies and become victor and ruler of the area. Dirty tricks abound and your catapults can be used to devastating effect.

The graphics are sparse and basic. Each army takes a different colour which is hard on the eyes. Bright blues, pinks and greens may look nice in the programmer's imagination but they look terrible to the player who has to squint to see what is going on. However, there is enough appeal in the game to detract from these basic graphics.

The remaining two games are **The Wild Bunch** and **Exodus.** The Wild Bunch is an adventure set in the wild west. Framed for a murder you didn't commit, you are out to nail the Wild Bunch. The game resembles a superior multiple choice with a selection of options given to you at every move.

Adventures written in that style are rarely as exciting as those written in the more conventional mode — they rapidly become tedious. Billed as a graphical adventure, The Wild Bunch has a few scenes dotted around the adventure which are well depicted. For the most part though it appears to be mostly text.

Exodus is your average arcade game packed with characters cloned from other games. Mutant llamas abound, hovver mowers, galleons and TV sets lurk and assorted aliens merely wait to get you. The game lacks excitement, the graphics flicker and the sound is fairly average.

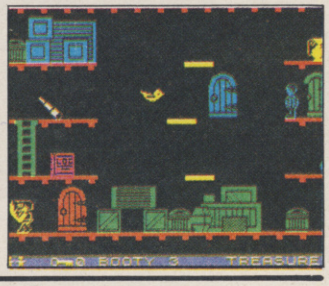
Clare Edgeley

BOOTY
Memory: **48K**
Price: **£2.50**
Joystick: **Kempston, Sinclair, Programmable**
Gilbert Factor: **7**

VIKING RAIDERS
Memory: **48K**
Price: **£2.50**
Gilbert Factor: **6**

THE WILD BUNCH
Memory: **48K**
Price: **£2.50**
Gilbert Factor: **5**

EXODUS
Memory: **48K**
Price: **£2.50**
Joystick: **Cursor, Kempston**
Gilbert Factor: **3**



Bikers out of control

ONCE they have fathomed how to choose the game control options budding BMX star-warriors should have a pretty good time with **Starbike,** a fast arcade production from The Edge.

You must steer your starbike across the planet's surface to rescue friendly droids and return them to the safety of your lander module via a teleport located in your sector.

Large numbers of hostile alien objects swarm over the screen and will eventually wear out your shields and send you to wherever it is deceased BMX star-warriors are supposed to spend eternity.

There are a number of control options and you can choose from several joysticks, the Fuller Master Unit, Interface 2 and Currah microspeech. Working out how to select those requires a couple of A Levels.

It may take you some time to get used to the thrust controls but, all told, the game is exciting and quite addictive.

Richard Price

STARBIKE
Memory: **48K**
Price: **£6.95**
Joystick: **Kempston, Fuller, Protek, Sinclair**
Gilbert Factor: **6**

Under starter's orders

AS A RESULT of the tremendous success of Track & Field in the arcades in this, the Olympic year, a number of companies have jumped on the bandwagon to produce clones for all micros.

The latest to enter the great race is Melbourne House with **Sports Hero.**

Crammed into the Spectrum's memory are four events — 100 metre sprint, long jump, 110 metre hurdles and the pole vault with a choice of three levels.

Under starters orders — BANG — and the runners were off, haring through the streets past grafitti covered billboards proclaiming 'Brixton Rules'. No time to recover — on to the next event.

If you qualify in all four events you will go onto the next level where you will find yourself running for the university team.

The game is played in the same way as Track & Field where you have two run buttons and a jump button — necessary for hurdles, pole vault and the long jump. In order to run you will have to press the run buttons rapidly and an indicator will chart your speed.

A few small grouses — there isn't any sound except for a bleep from the starter's pistol. The game would be greatly enhanced if you could hear the sound of feet pounding up the track.

Sports Hero is a one player game so you do lose the competitive aspect when playing with someone else and there are only four events albeit over three difficulty levels. Programmers are stretching the Spectrum to its limits — more events would have added a welcome variation.

Clare Edgeley

SPORTS HERO
Memory: **48K**
Price: **£6.75**
Joystick: **Sinclair, Programmable**
Gilbert Factor: **6**

more software on page 42

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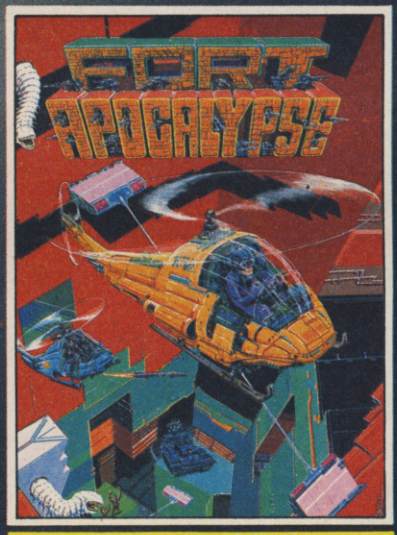

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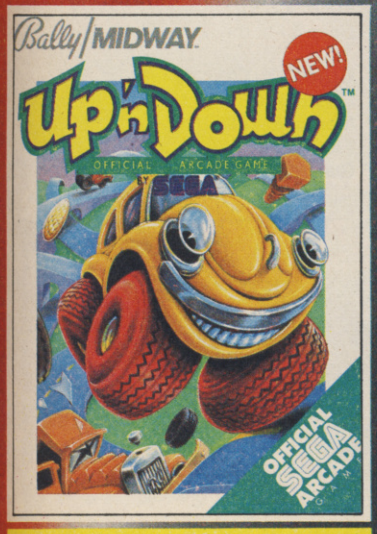

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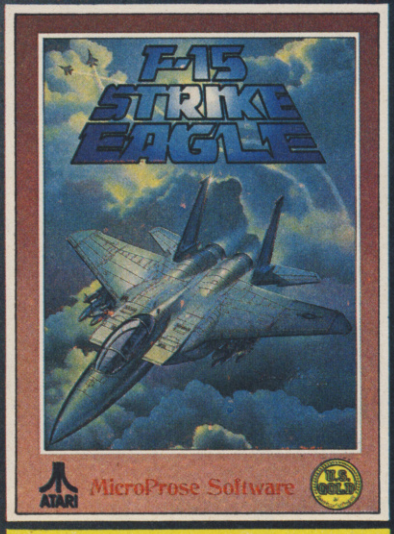

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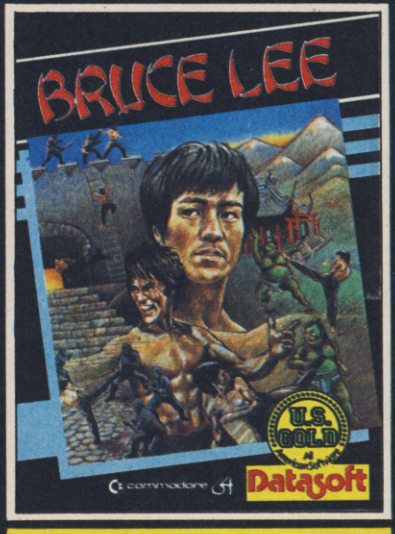

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Action through the ages

EUREKA!, Ian Livingstone's package, from Domark, contains something for everyone. Each of the five sections is prefaced with an arcade game which builds up the character's strength, or vigor, but tires the playing fingers.

In the prehistoric maze you are represented by a little figure, the size of a character square and difficult to distinguish from its background. You must guide it around the maze, picking up roast chicken legs while avoiding flashing squares which rush at you and jumping on those which try to run away.

All those antics have a strange sort of logic to them. If you want to keep your sanity, however, it is best to pick up the nearest leg and make a dash for the exit. If you are not quick enough on the fire button, for this game surely requires a joystick, more chicken legs are scattered around the maze.

Once through the finger punishment phase one of the adventures may be loaded. Those take you into a series of time slips through which you have to travel to find the pieces of a talisman first discovered on the moon by Apollo XVII but later shattered and lost in time.

First stop is the prehistoric age in which you can become breakfast for a dinosaur, discover hidden pitfalls, and become lost in one of the many forests which dominate the land.

If, after that, you are inclined to travel further you can load the next program and slip back to Ancient Rome where the slaves are revolting and the lions ravenous. Livingstone's long association with role-playing games ensures that full mythology value is injected into the scenario.

The mythological strain continues with a trip to Celtic Britain where you have to rescue the wizard Merlin and meet the crew of Camelot.

Once you have got those pieces of the talisman you can travel to the two final segments of the package which take place in the near past.

Despite the combination of arcade and adventure games the package is disappointing as it offers nothing new.

The package is good value however, especially considering the £25,000 prize for the lucky winner.

John Gilbert

EUREKA!
Memory: **48K**
Price: **£14.95**
Joystick: **Kempston, Sinclair**
Gilbert Factor: **8**

Heroics for he-men

THE USUAL lantern-jawed, muscle-bound hero adorns the cover of **Tower of Despair** from Games Workshop. A swift reading of the background history reveals a plot and setting not too far removed from *Lord of the Rings* — the hellish and very nasty sorcerer has resurfaced and orcs are abroad.

The Wizards' Council is extremely worried and has summoned you, the warrior-mage of Castle Argent and part-time weight lifter, to remove this Malnor chap and his demonic legions.

To do that you must find the Golden Gauntlet, currently in the possession of another elderly ex-hero. Journey through the wilderness, survive many perils, find the Tower, rub out Malnor. So much for the plot.

The adventure contains two complete sections. The program is written on the Quill and is text-only, though the character set has been changed to a pleasant medieval script with the occasional illuminated capital.

Naturally enough there are assorted monsters to overcome and care will need to be taken with the magical artifacts you encounter.

D & D devotees will probably feel at home in the land of Aelandor but more reluctant heroes may find they have been there too many times already.

Richard Price

TOWER OF DESPAIR
Memory: **48K**
Price: **£7.95**
Gilbert Factor: **5**

Conquer Kent, crush Kabul

ALTHOUGH there have been many attempts to produce wargames on the Spectrum of comparable quality to the boardgames of the mid-seventies, few have managed to match their ancestors.

Lothlorien has attempted to rectify that with **Confrontation,** a system which allows players to define their own maps and forces for play.

The system suffers from being a two-player game, relegating the computer to the role of the umpire.

Battles are modern in style, with armoured and foot infantry, aircraft and artillery. The mechanics are of the move-fire type, with mobile units moving first and each player moving in turn.

The graphics are attractive and easy to follow. There are no confusing figures to interpret.

The Confrontation package includes a simple scenario to start you off. Lothlorien has also released a cassette of scenarios based on 'real' events, which cannot be used without the original program.

The scenarios are bold in conception; Egypt vs Israel across the Sinai desert is an exercise in chess-like precision of communication lines.

An Angolan scenario in which Unita defends coastal strongpoints against Cuban-trained forces introduces the possibility of South African reinforcements.

Operation Sea Lion enters the world of alternative history with the German invasion of Kent, while the fourth scenario has a Soviet column attempting to force a passage through the mountain passes of Afghanistan.

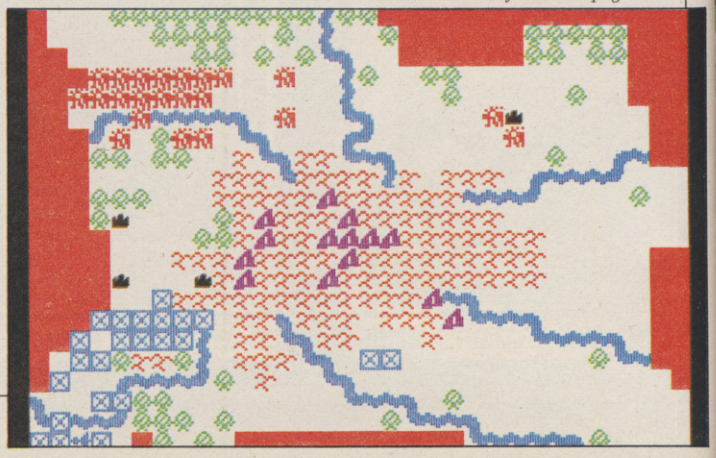
All of the scenarios, as well as the main program, are well-constructed and represent challenging problems for keen wargamers. They will welcome the series with enthusiasm. But those who cannot claim to be avid armchair generals are less likely to find a sometimes frustrating business enthralling enough to justify the investment.

Chris Bourne

CONFRONTATION MASTER PROGRAM
Memory: **48K**
Price: **£7.95**
Gilbert Factor: **7**

CONFRONTATION SCENARIOS VOLUME 1
Memory: **48K**
Price: **£5.95**
Gilbert Factor: **7**

more software on page 44



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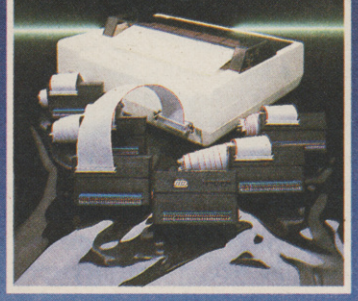

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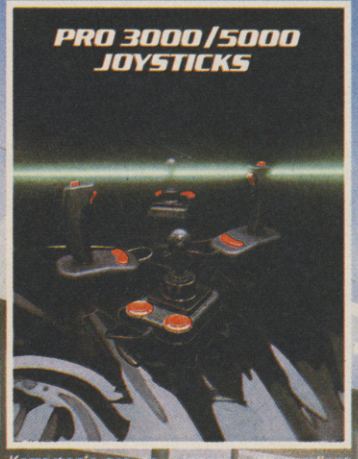

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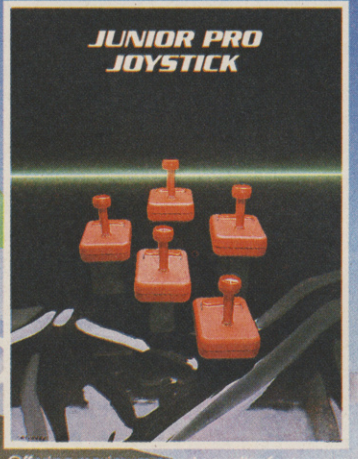

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An audience with Machiavelli's Prince

DUPLICITY, cunning and self-interest are the keynotes of the 1984 Cambridge Award winner, **The Prince,** written by John Sherry and published by CCS. The title is consciously derived from Machiavelli's handbook of politics and is designed for four players.

Set in a gloomy renaissance fortress the game is a combination of strategy and adventure formats. The aim is to become Loremaster and chief counsellor to the Prince, ruler of this land, and each character must get to the top by any means possible — whether it be theft, kidnap or mayhem.

After engaging the services of henchmen — who can 'hit' other castle servants and characters — and spies who can report on the actions of other people, each player moves around the fortress giving instructions to his staff and trying to secure the tokens which will ensure advancement. Goods can be bought and sold from the castle trader and a banker will arrange transfers of cash. Each player has a passcode which will allow him to take his turn — other players are not supposed to observe this but are sure to try.

Life is not simple since any of the spies and henches recruited may well be working for other player-characters and information may be bought and sold.

The computer keeps track of your money and possessions and informs you of your current position at the beginning of each turn. Input is in standard verb/noun combinations and there is a hidden vocabulary besides the predefined commands for controlling your gang.

The Prince will involve you in much bargaining and chicanery with the three other human players. Alliances may be formed and broken, lying and deceit will be the most normal interactions. An audience with the Prince himself is possible but he is temperamental and will brook no impertinence.

Ten inputs are allowed for each turn so you must plan your strategy carefully. Pictures of the people you are talking to are shown on-screen and the character set is a mock-gothic script.

The game is well-constructed and, since you only ever have a partial view of the goings on, is full of the unexpected. *Diplomacy* addicts will feel quite at home here as the web of treachery spreads through the palace and it is easy to become utterly absorbed in your character.

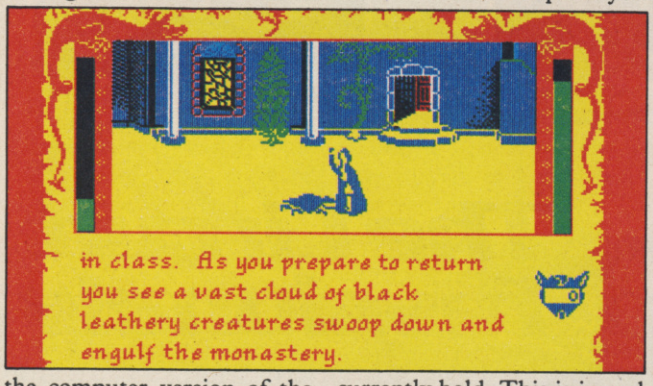
Richard Price

THE PRINCE
Memory: **48K**
Price: **£7.95**
Gilbert Factor: **8**

Code of the warrior

BEFORE your very eyes the bestial forces of the Darklords have destroyed your monastery and friends. Revenge is in your heart but you must first reach the capital and warn the king of the impending onslaught. War and danger will bedevil your every step.

Flight from the Dark is the computer version of the Arrow single role-play book and the program is packaged with it for double enjoyment and references. The program contains new situations but follows the original plot and the screen display will show if you are dealing with a section of the book by indicating the relevant paragraph.



Options are scrolled up below the graphic display and the choice is made by a keypress. Other actions are also controlled by single keys and an overlay is provided for the purpose — this could have been made more solidly.

The graphics are animated and you are shown walking or riding through the locations. If you encounter an enemy there is a very clever combat sequence which allows you to thrust, swipe, chop and parry with whatever weapons you currently hold. This is in real time and can be a nail biting experience as your survival will depend on the fighting skill you have built up in the course of your travels.

Addicts of the book version will find the program every bit as demanding and exciting. The general quality of the graphics enhances that pleasure.

Richard Price

FLIGHT FROM THE DARK
Memory: **48K**
Price: **£8.95**
Gilbert Factor: **8**

Willy in armour

IF YOU OWN a 16K Spectrum and have felt left out since Manic Miner and Jet Set Willy were produced for the 48K machine then **Sir Lancelot,** from Melbourne House, may take away some of the heartache.

Although the author does not equate the game with the best-selling Willy series there are some obvious parallels. As the fabled knight in shining armour you must investigate 24 rooms through which have been strewn treasures, including keys, crowns and gold, and seven different types of monster. They move mechanically up and down or across the screen and your task is to develop a strategy to defeat them and retrieve the treasure.

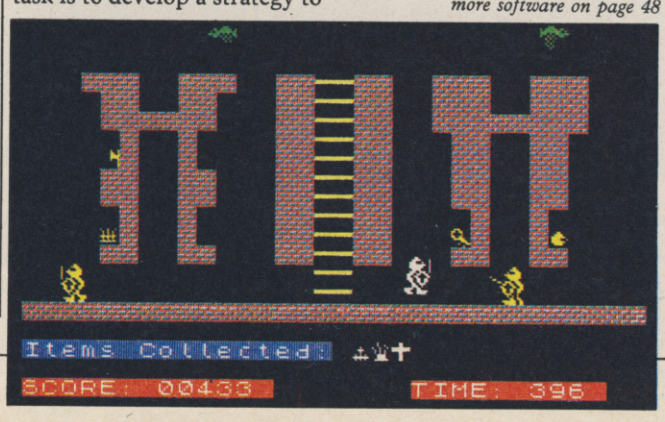
The solutions to the treasure quests on each screen are made harder when the objects seem to be out of reach. However, each screen contains an answer and it just takes practice to get to the next one.

Sir Lancelot is a 48K game crammed into a 16K machine and as such the author should be congratulated.

John Gilbert

SIR LANCELOT
Memory: **16/48K**
Price: **£5.95**
Joystick: **Kempston, Sinclair, Cursor**
Gilbert Factor: **7**

more software on page 48



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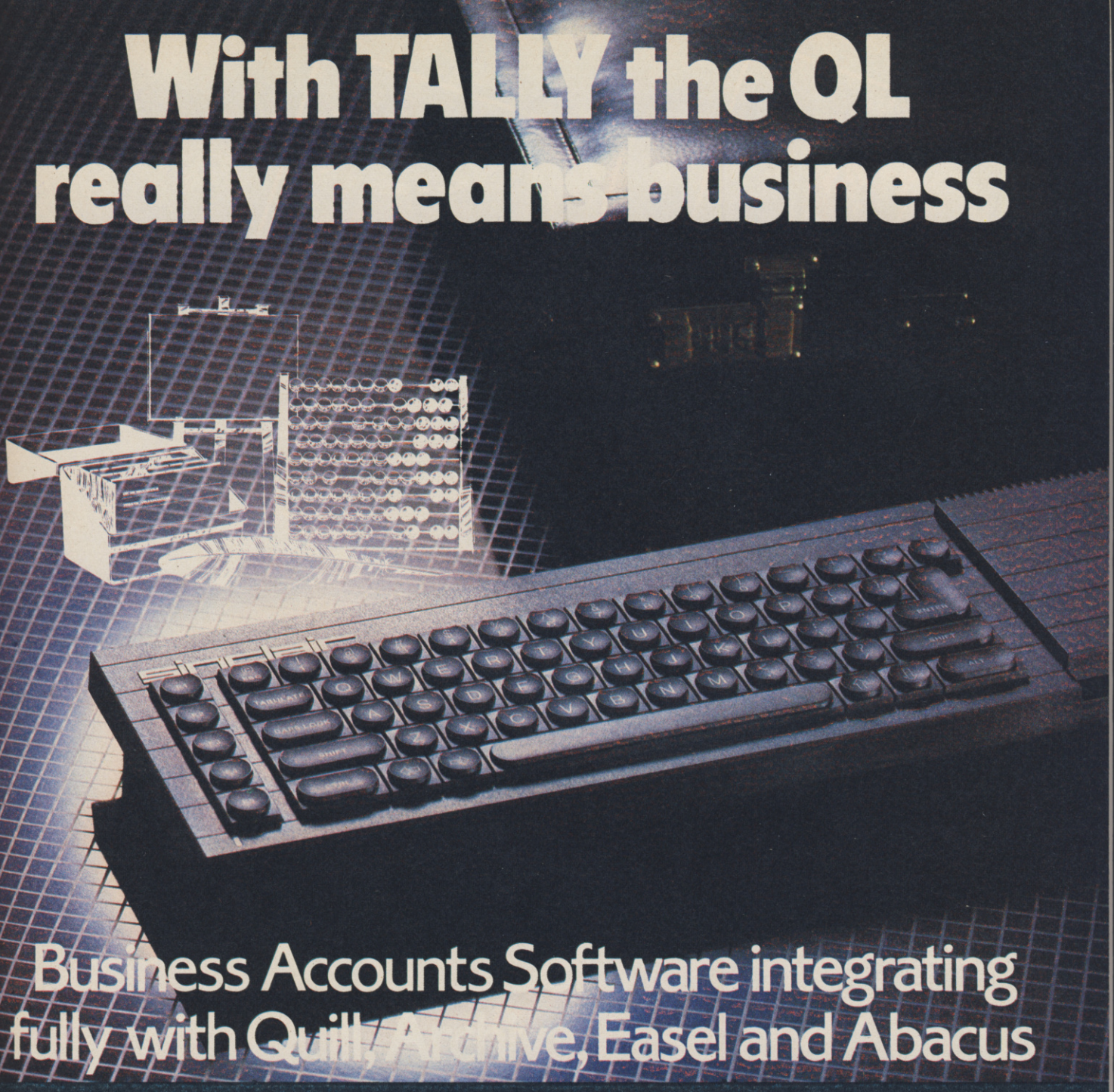

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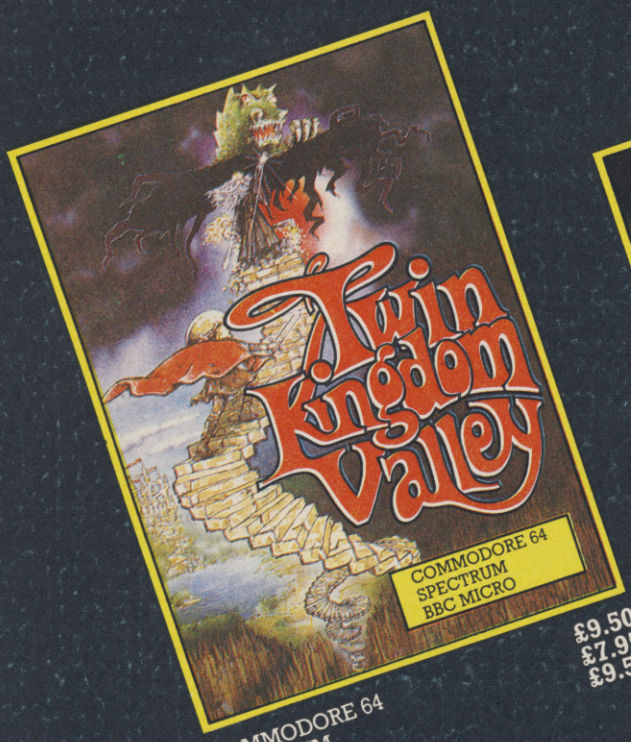

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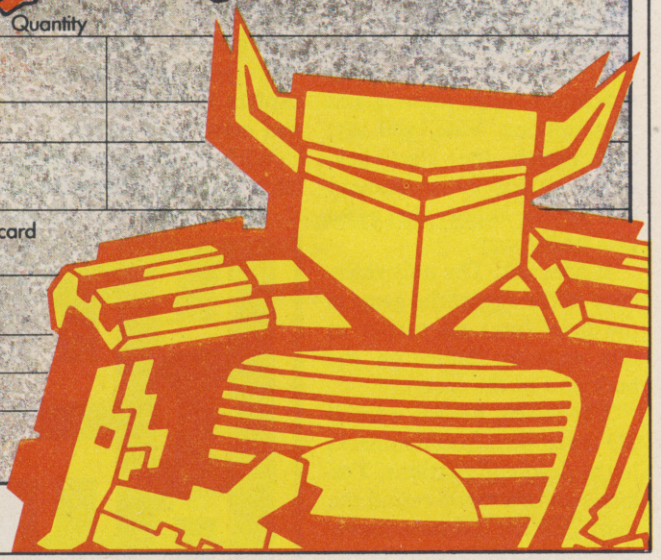
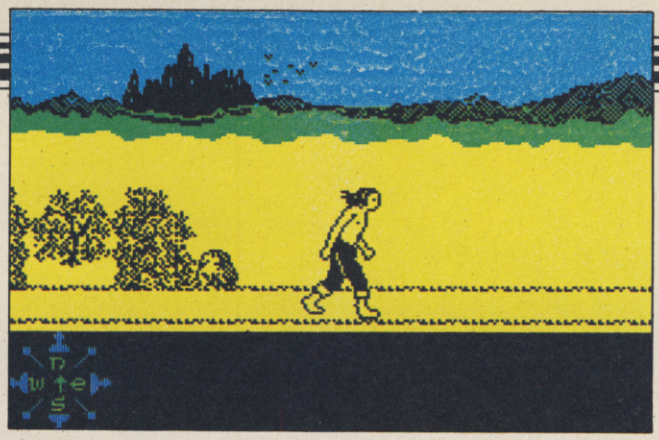


Celtic quest of Cuchulainn



OTHER programmers will find it difficult competing with **Tir Na Nog** from Gargoyle. Until you have loaded up you may think that the booklet's boast of a 'computer movie' is pushing it a bit. Not so — this animated graphics adventure is bound to become a classic of Spectrum programming and portrays the travels and adventures of the hero Cuchulainn through the Celtic afterworld, Tir Na Nog.

Cuchulainn strides tall, clear and purposeful along the paths of his world. Fore-, middle- and backgrounds scroll independently behind him, giving a convincing likeness of real movement. The camera angle can be altered so that he can be seen from four viewpoints and the scenery changes accordingly. The clouds roll, smoke billows, birds flutter.

Other characters are shown in equal detail and live their own lives whilst Cuchulainn obeys you in his search for the fragments of the Seal of Calum.

Not that you have to pursue the quest. You may choose to wander the roads and explore the intricacies of the world or follow secondary objectives that may well need to be completed before the major aim can be accomplished. Other characters may lay tasks on you too and events may force you in a certain direction at times.

Beware of the Sidhe, those powerful, dangerous and magical beings who also use the pathways. Combat may occur if all else fails and Cuchulainn can thrust with any weapon he may have found. To progress and survive you will need persistence, lateral thinking and good luck — though of course you cannot be killed, merely returned to the beginning.

The game is not designed as a text adventure and uses the keyboard for movement and initiating various actions. Do not be misled by this into thinking that it is an arcade game — the program scope is vast and the world it depicts is alive and full of atmosphere. This is a full adventure and, with no single or simple solution, may keep you occupied for a long, long time. Highly original and stunningly presented.

Richard Price

TIR NA NOG
Memory: **48K**
Price: **£9.95**
Gilbert Factor: **9**

Grasshopper's leap

BECOME a master of the ancient oriental art of Kung-Fu without dislocating your back or having the wind knocked out of you.

Kung-Fu, from Bug-Byte, is described as a totally animated combat game for two players or one player and the computer.

Each player controls one of the Kung-Fu fighters which must approach each other in a very inscrutable way before bashing the hell out of each other. Bug-Byte may enthuse about the graphics and crow about the cleverly designed fighters but, although the display initially looks impressive, movement is jerky and action slow. The fighters move as if they are robots.

Much emphasis is put on the techniques which the fighters can use when in action. Such moves are fairly authentic but the movement between a standing pose and making contact with the other player could have been made more realistic.

If you are going to play Kung-Fu with any kind of agility then you will need a joystick. You will then at least get some enjoyment out of it and not get whitewashed by a computer Ninja.

John Gilbert

KUNG-FU
Memory: **48K**
Price: **£6.95**
Joystick: **Programmable, Cursor, Sinclair, Kempston**
Gilbert Factor: **6**

more software on page 50

Game for the turtally warped

CLAIRVOYANTS should have a ball with **Turtle Timewarp** from Softstone. A brief examination of the cassette blurb reveals nothing about the game apart from the loading instructions.

After a nice loading screen information appears offering redefinable keys, joystick and start options. Fine, you say, and punch the start key, thinking that enlightenment will arrive before the game gets under way.

It does not. The only reference to the aim of the game is the brief 'save all turtles in this amazing game' on the back end of the insert.

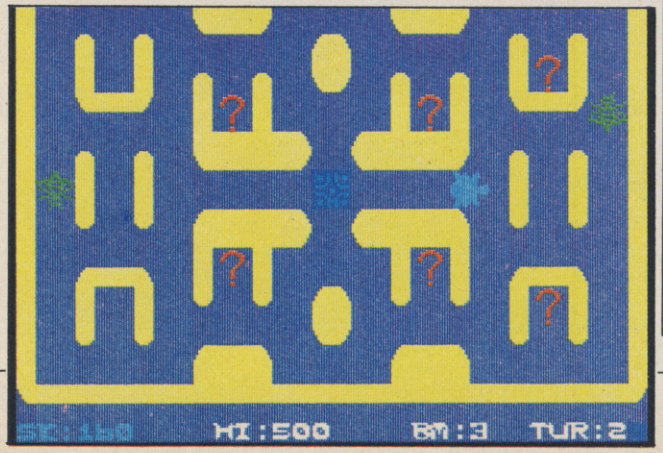
The screen depicts a small 2D maze with questionmarks in the dead-end portions. You manoeuvre a turtle round the maze into the questionmarks. Sometimes that results in the creation of unpleasant insects to add to those already chasing the turtle.

Sometimes a house is materialised which blocks off corners and makes life more difficult for the biting bees. If they get you, you lose a life. Once you have managed to explore all the questionmarks you move up a screen.

With no game concept to latch onto the business seems singularly pointless, though the graphics are reasonably fast. The competent rendering of *Für Elise* was more gripping than the game and the choice of questionmarks as symbol very apt. A crystal ball could come in handy if you have one.

Richard Price

TURTLE TIMEWARP
Memory: **48K**
Price: **£2.99**
Joystick: **Kempston**
Gilbert Factor: **4**



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The FDS Keyboard has real individual contact switches and not a membrane like most other Spectrum keyboards on the market which are more expensive.
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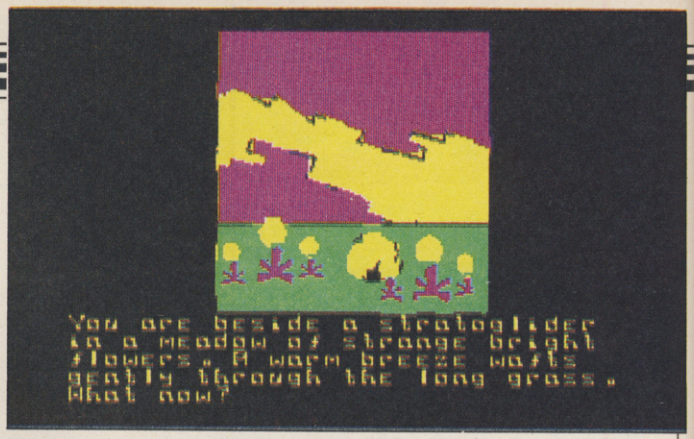
Snowbound in Eden



DOWN to earth at last, Kim Kimberley, secret agent extraordinaire and saviour of the starship *Snowball,* has been framed for an act of sabotage. Fleeing the wrath of the woken colonists she steals a stratoglider and enters the atmosphere of Eden, the *Snowball's* destination. Condemned to death she has only a short time to hide in the luxuriant and bizarre undergrowth of the planet. The ship need only turn its engines towards her to fry her to a crisp.

So begins **Return to Eden,** another brain scrambling adventure from Level 9 and sequel to **Snowball.** The presentation has changed — the game includes location graphics, yellow word display on a black background and 'write ahead'. That feature allows you to input text in a continuous flow without waiting for the cursor to reappear.

There are around 250 locations and Level 9 claims that the use of graphics has not adversely affected the amount of description or the general quality. Initial exploration seems to back that up. If you find the graphics too slow they can be switched out.

Once safe in the jungle you must head out for the robot-manned city in the east. You must survive amongst the beautiful but lethal flora and fauna and avoid the robot devices which protect the city.

Problems and puzzles abound; this is a world unknown to humans and many plants or creatures have odd properties. Just trying to survive ten minutes is difficult — Level 9 keep rolling those heavy dice on you but give you a few resurrections before finishing you off.

Exhausted compulsives of the firm's other works may just as well admit to themselves now that they probably won't be sleeping much for the next few months. Atmospheric and original.

Richard Price

RETURN TO EDEN
Memory: **48K**
Price: **£9.95**
Gilbert Factor: **8**

Space, the final . . ?

THE AGE OLD game of **Star Trek** has been resurrected to bring to your screens **New Cylon Attack,** from A'N'F Software.

Following the successful BBC version of the game, New Cylon Attack now boasts improved graphics and playability.

The storyline is familiar and brings to mind scenes of a portly Captain Kirk at the helm of the *Starship Enterprise.* You are pilot on board a supply ship carrying reinforcements to a distant planet in a war-torn galaxy.

The game portrays the sights of your laser gun in the middle of the screen with moving crosshairs. By moving these you are able to pinpoint the Cylons as they fly at the mothership.

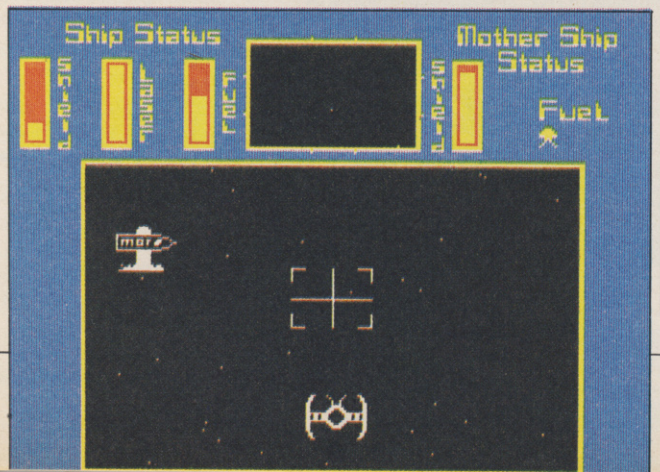
As well as the radar scanner there are a few other instruments which need constant monitoring including fuel situation, the state of your lasers and shield strength.

Your tanks may be refuelled during the game, which involves wandering round space looking for the mothership to dock on to. No fun with empty tanks and as often as not your fuel will run out just as she is in sight.

The graphics aren't astounding and the sound fairly average. New Cylon Attack is not the most original game but it is by no means the worst.

Clare Edgeley

NEW CYLON ATTACK
Memory: **48K**
Price: **£5.75**
Joystick: **Kempston**
Gilbert Factor: **5**



A better Basic

BETA BASIC, from Betasoft, has already established itself as the standard extended Basic for the Spectrum. The launch of version 1.8 confirms that view with routines added to support Interface and microdrives.

The new language adds 30 new commands and 20 functions to Sinclair Basic and makes use of the structuring commands which are available for machines such as the BBC Micro and the Commodore SX-64

The language is so much better than the Sinclair Basic. As well as the structure commands such as DEF PROC which creates procedures similar to those on the QL there are also programming aid utilities, graphics commands, easier access to the memory of the Spectrum and a real time clock which even has an alarm.

The utilities include an AUTOline number command, a command which TRACEs the number of a line as it is executed in a program RUN and a horizontal screen SCROLL which behaves in a similar fashion to that on the ZX-81. There is also a ROLL utility which will scroll the screen vertically in any direction.

The 20 new functions include a PEEK which looks at 16-bit words, decimal to binary and decimal to hexadecimal converters, a SCREEN$ command which recognises both ordinary and user defined graphics and a function to convert a number into a different format such as that of decimal currency.

It is a great pity that Sinclair Research has not brought out a version of Beta Basic on its new Spectrum+ either on board the machine or as a microdrive cartridge or ROM. Betasoft turns Sinclair Basic from a good version of the language to a fantastic one.

John Gilbert

BETA BASIC
Memory: **48K**
Price: **£11.00**
Gilbert Factor: **9**

more software on page 52

ARCADE ADVENTURE WITH TECHNICIAN TED

As Technician Ted you clock in for work at the strangest factory – even getting in can be a problem! You have a number of important tasks to perform, but most days there just don't seem to be enough hours in the day to get all your work completed.
See if you can get through 50 screens of varying complexity, but watch out for the most unhelpful workmates you ever came across! There's the Fire Extinguisher that seems to have gone beserk! Some very unfriendly faces, and even the boardroom chairs aren't always what they seem!
What's more, Technician Ted incorporates a unique animated loading screen and perfected collision detection.
Colourful and detailed graphics coupled with smooth action and continuous sound are likely to make Technician Ted 1985's top game.
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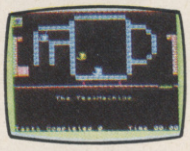

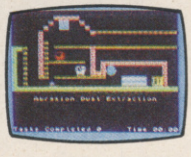

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Can you master it sooner?

For the Spectrum 48K. £7.95

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Knocked for six

A "REVOLUTIONARY" concept, at least according to publisher Computer Records, has recently hit the streets in the form of a compilation of 12 popular games from companies including Bug-Byte, Quicksilva, Anirog and Ocean.

They have been released under the collective title **Select 1** and the company claims that if every game was brought separately the player would have to pay about £70.00. Quite a saving.

Some of the games are ancient but in the same package you will find more recent titles which include **Hunchback, Mr Wimpy, Missile Defence, Pool, Denis through the Drinking Glass** and **Moon Buggy.**

In Denis through the Drinking Glass, the idea is to help Denis Thatcher stagger to the Gravediggers Arms to revitalise the parts that Maggie cannot reach.

In this Quilled adventure from Application Software, Denis is at his wits end — there is not a drop of booze at No 10. Escaping from Maggie's loving clutches is no easy matter and apart from the worry of being caught by the wife he has to negotiate sundry personalities as Mary Whitehouse and Ken Livingstone en route.

The player has only ten moves in which to find the elusive flask of gin which makes up Denis' breakfast. Without it he will fall into a stupor and the game will end. Delirium tremens sets in if at the ninth move Denis still hasn't had a swig.

Denis through the Drinking Glass gently mocks the Iron Lady and her retinue in a game which can be great fun.

Missile Defence from Anirog is based on the classic arcade game where you have to protect your city from a murderous alien attack. The game is quite fast, but your bomb sights move too slowly to contain the aliens on the higher levels.

Moon Buggy, also from Anirog, is a poor representation of the original game. The graphics are sketchy with an almost unchanging background, and the aliens are almost non-existent.

However, the package is very good value especially as a Christmas present. You may well have most of the games but even the three or four games which are new to you will make the package worthwhile. *Clare Edgeley*

SELECT 1
Memory: **48K**
Price: **£12.49**
Joystick: **Available for some of the games**
Gilbert Factor: **7**

Arthur's unoriginal adventure

REMEMBER the old dinosaur mazes? Moving along one square at a time you could turn right or left to enter side passages. **King Arthur's Quest** uses a similar type of movement system, though the countryside and rooms depicted are not bounded in the same way.

The wicked Morgana Le Fay has put a spell upon the land. The world is slowly dying and you must save it from the Enchantress and her magic. You begin in Merlin's cottage and must examine the grids to collect useful objects or meet the various characters.

There are nine basic actions each carried out by a single key press — a rather flimsy overlay is provided to show the relevant keys.

This is not a normal text adventure, given the very limited range of input, and may consequently appeal to a younger age group. The graphic displays are sufficiently pleasant, though unoriginal in style, and the response time is fast. There is a microdrive transfer facility but if you are killed during play you must reload.

Richard Price

KING ARTHUR'S QUEST
Memory: **48K**
Price: **£7.95**
Gilbert Factor: **4**

How to make a touchdown

FOURTH down and three. Will you run or pass?

If that means little to you then you are clearly no fan of American Football. Recent television coverage of the sport has aroused an interest in Britain, and Argus Software has responded by releasing a simulation, **American Football.**

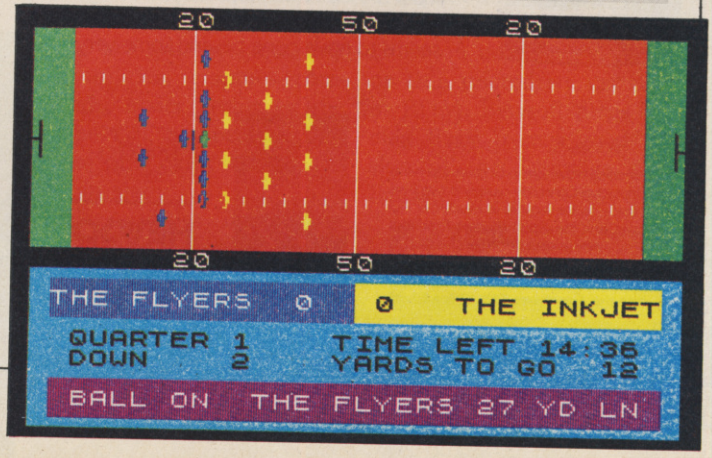
The game is a strategy version, in which you as the team coach select your style of attack or defence from a menu, and the computer, or another player, selects a response. The results are displayed on the screen with animated graphics rather in the style of **Football Manager,** with small figures moving into various positions and working through the selected plays.

American Football lends itself well to computer simulation, as the real game is played as a series of tactical set pieces where the object is to gain as many yards from a single play as possible, before scoring a touchdown by taking the ball across the opponents' goal line. Since the game proceeds in fits and starts, the computer version does not lose so much realism as comparable versions of Soccer or Basketball.

Those who are not familiar with the sport are nevertheless unlikely to be enthusiastic about the game, as it only really becomes fun if you allow your imagination to visualise what is being simulated.

For those who do know something of the game, the program is much more fun, and can be heartily recommended. *Chris Bourne*

AMERICAN FOOTBALL
Memory: **48K**
Price: **£9.99**
Gilbert Factor: **7**



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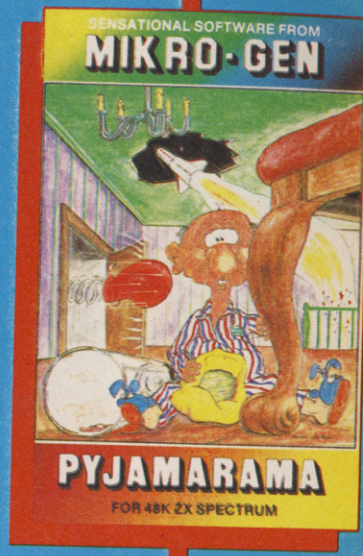
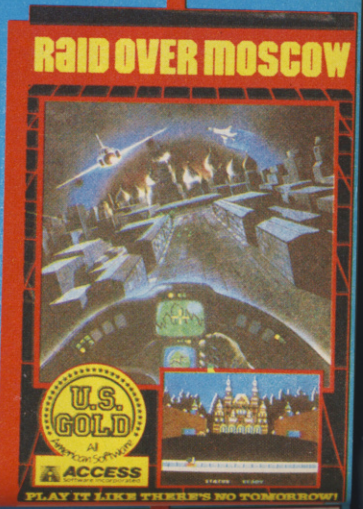
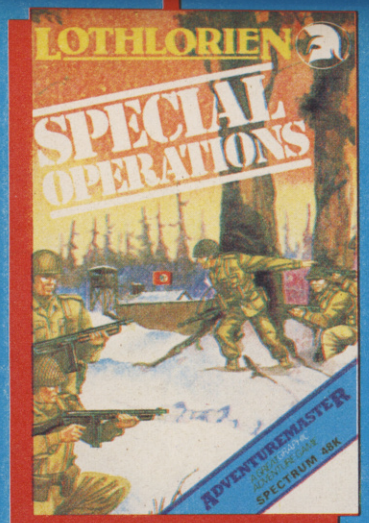
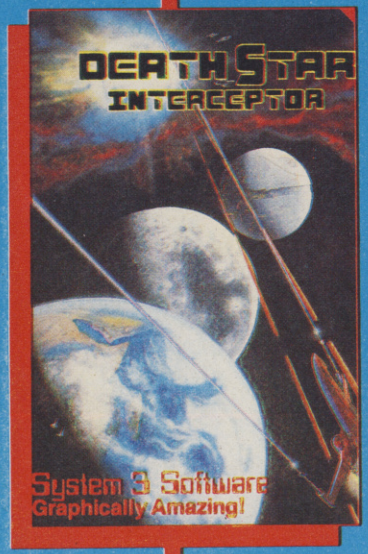




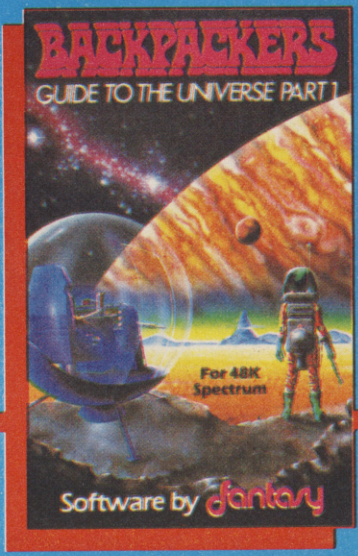
THIS WEEK	LAST WEEK	WEEKS IN CHART	TITLE	Publisher	Computer	(Also Available on) SPECTRUM	VIC 20	CMMDRE 64	ELECTRON	ATARI	DRAGON	ORIC	BBC	OTHER
1	1	6	DALEY THOMPSON'S DECATHLON	OCEAN	SPECTRUM	●		●						
2	2	7	DALEY THOMPSON'S DECATHLON	OCEAN	COMMODORE 64	●		●						
3	3	4	ELITE	ACORNSOFT	BBC								●	
4	6	2	COMBAT LYNX	DURRELL	SPECTRUM	●								
5	10	4	CHILLER	MASTERTRONIC	COMMODORE 64			●						
6	–	1	UNDERWURLDE	ULTIMATE	SPECTRUM	●								
7	–	1	SELECT GAMES ONE	COMPUTER RECORDS	COMMODORE 64	●		●						
8	11	1	PYJAMARAMA	MIKRO-GEN	SPECTRUM	●								
10	12	12	BEACH-HEAD	ACCESS/U.S. GOLD	COMMODORE 64									
11	21	2	BMX RACER	MASTERTRONIC	SPECTRUM	●								

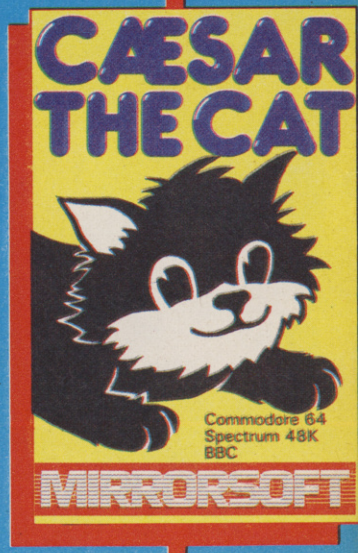
8	11	1	PYJAMARAMA MIKRO-GEN	COMMODORE 64	●		●							
9	9	6	MONTY MOLE GREMLIN GRAPHICS	SPECTRUM	●									
10	12	12	BEACH-HEAD ACCESS/U.S. GOLD	COMMODORE 64 SPECTRUM	●		●							
11	21	2	BMX RACER MASTERTRONIC	SPECTRUM	●									
12	22	2	TIR-NA-NOG GARGOYLE	SPECTRUM	●									
13	18	4	KOKONTONI WILF ELITE	SPECTRUM	●									
14	7	3	JET SET WILLY SOFTWARE PROJECTS	COMMODORE 64	●		●							
15	15	6	MONTY MOLE GREMLIN GRAPHICS	COMMODORE 64	●		●							
16	–	1	PERILS OF WILLY SOFTWARE PROJECTS	VIC 20		●								
17	–	1	EDDIE KIDD'S JUMP CHALLENGE MARTECH	SPECTRUM	●									
18	–	1	BACKPACKER'S GUIDE TO THE UNIVERSE FANTASY	SPECTRUM	●									
19	–	1	KNIGHT LORE ULTIMATE	SPECTRUM	●									
20	16	2	DECATHLON ACTIVISION	COMMODORE 64	●		●							
21	19	3	D.M. IN DOUBLE TROUBLE CREATIVE SPARKS	SPECTRUM	●		●							
22	4	4	BEACH-HEAD ACCESS/U.S. GOLD	SPECTRUM	●		●							
23	–	1	SUICIDE EXPRESS GREMLIN GRAPHICS	COMMODORE 64			●							
24=	–	1	AMERICAN FOOTBALL MIND GAMES	SPECTRUM	●									
24=	8	2	AVALON HEWSON CONSULTANTS	SPECTRUM	●									
26	27	2	SUMMER GAMES QUICKSILVA	COMMODORE 64			●							
27	–	1	RUBIK CUBE SOLO	SHARP										●
28	–	1	D.M. IN THE BLACK FOREST CHATEAU CREATIVE SPARKS	SPECTRUM	●		●							
29	23	10	FULL THROTTLE MICROMEGA	SPECTRUM	●									
30=	–	1	STEVE DAVIS' SNOOKER CDS MICRO	SPECTRUM	●									
30=	–	1	MANIC MINER BUG BYTE/SOFTWARE PROJECTS	SPECTRUM	●		●				●	●	●	●





Look out for the brand new Top Ten in the Saturday edition of the Daily Mirror every fortnight and Sinclair User every month. The information for the Top 30 is compiled by N.O.P. Market Research and founded by Computer & Video Games magazine in sponsorship with the Daily Mirror.





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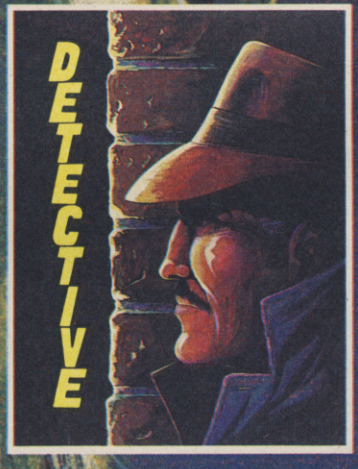

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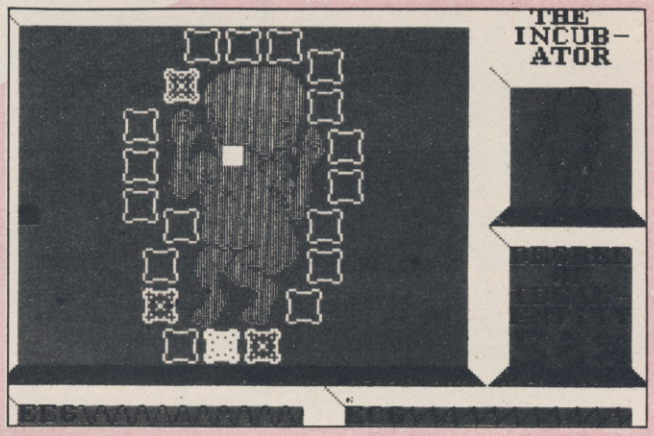
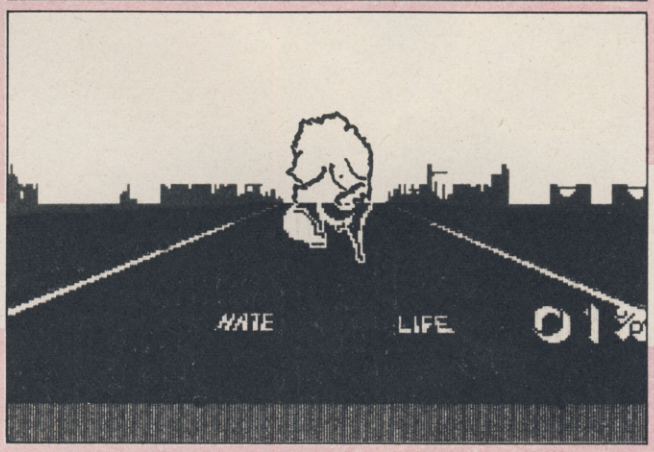
When you have done that, name the two personalities in the pictures, both of whom are involved in the soundtrack of the game.

Send the completed wordsquare, or a copy, plus the names of the two celebrities to *Sinclair User*, EMAP Business and Computer Publications, 67 Clerkenwell Road, London EC1R 2AU. The competition closes on January 18, 1985, and the first 50 correct entries pulled out of the hat after that date will receive a copy of *Deus Ex Machina*. Employees or associates of Automata or EMAP are not eligible for the competition. Only one entry per contestant is allowed.





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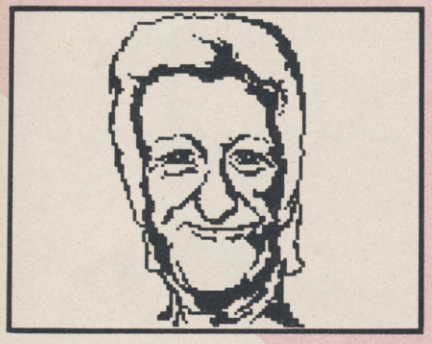

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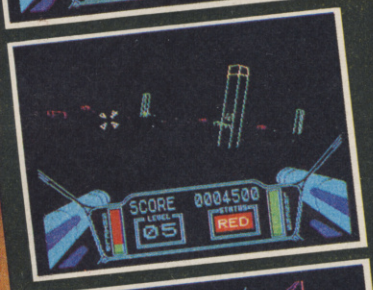

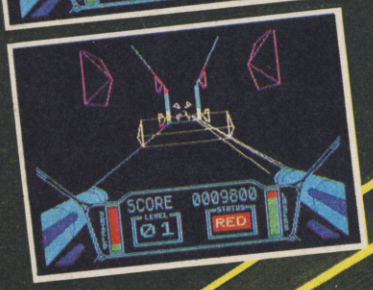

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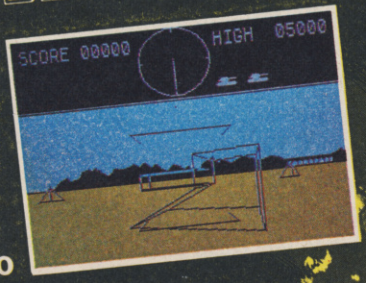

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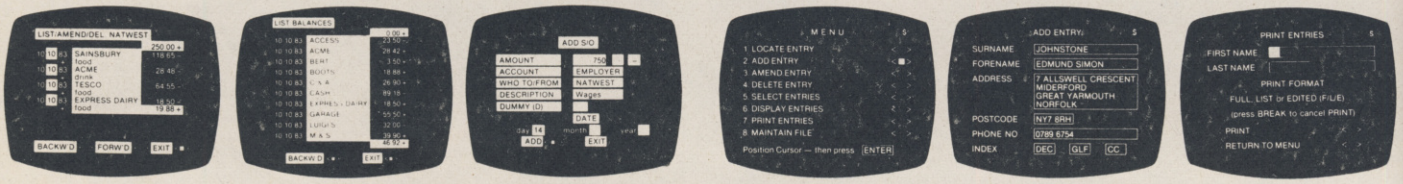

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Having all your finance records so neatly stored is the height of efficiency! The program is entirely menu driven for ease of operation, yet the facilities are so extensive you'll soon wonder how you managed without it.

ADDRESS MANAGER £8.95 PLUS 80 £19.95

A very useful MACHINE CODE application program with limitless applications at work and at home.

Manage your address book with efficiency and speed! Address Manager stores up to 350 names, addresses, and phone numbers – depending on their length. Or up to 1200 individual names/titles/references. The Plus 80 version also embodies a comprehensive Label Printing routine.

In the office, Address Manager can store internal phone directories, store and analyse customer's records, and much much more.

If you've already got Finance Manager and/or Address Manager but in non-Microdrive format, and you'd like to update them we'll give you a £3 rebate towards the cost of a Microdrive Compatible 32 Column, or £5 off the plus 80 version. This offer is available via mail order only.

The OCP range includes: VAT Manager, Address Manager, Finance Manager, Stock Manager (80 Column only).

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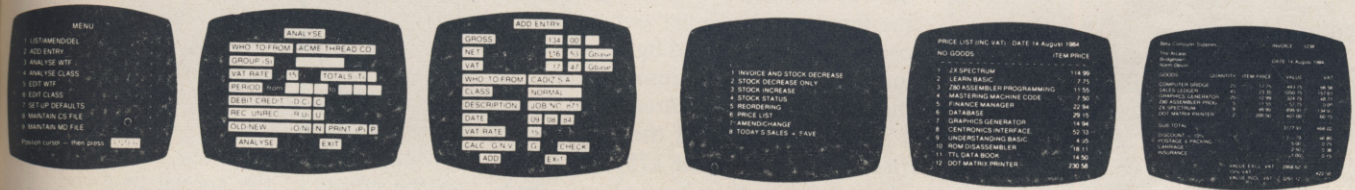

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Your VAT 100 return need no longer be a headache! Simply key in the Gross or Net values of all the period's sales and purchase invoices and VAT Manager will check, analyse and total all the relevant details. Available in 32 Column or Plus 80 versions, VAT Manager will check all calculations automatically, and will even work out details of exempt totals where the trader is not required to pay VAT. This is performed with its CLASSIFY feature for types of transactions, and GROUP feature for more detailed analysis.

PLUS 80 STOCK MANAGER £19.95

Provides a controlled stock environment for up to 600 different product lines.

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A British expedition dares to recreate Scott's last journey to the South Pole. Sid Smith asks why they want a QL.

Pole-star QL on Southern Quest

A BRITISH team is planning a year in the Antarctic and the first walk to the South Pole since Scott's 1912 expedition — and is taking a QL.

The five Britons are about to set off on one of the world's worst journeys. They will camp on the Antarctic ice for at least a year in temperatures down to −60 Centigrade, and then two of their number will attempt to walk almost 900 miles to the South Pole, pulling all their supplies behind them on specially designed man sledges.

Throughout their stay, a Sinclair QL will be solely responsible for the management of scientific data, for the production of a book about the expedition, and for the logging of day-to-day radio contact with the two men on their solitary, 85-day journey.

"We chose the QL because it was much the most exciting computer available," says expedition manager William Fenton. "Because it was small, because it was powerful for its size, and because we thought we'd take something adventurous. And because we liked Clive Sinclair."

Their expedition, *In the Footsteps of Scott,* grew from a desire to retrace the historic journey of Robert Scott to the South Pole seventy years ago.

However, the five men have no desire to repeat the ultimately fatal outcome of that earlier trip, and are counting on the best of modern technology — including the QL — to see them through.

"The difficulties of walking 900 miles across the Antarctic are almost insurmountable," says Mike Stroud, the expedition doctor who will be using the QL more than anyone else. "It's only by sticking to a most rigid diet, in the form of calories per ounce, and by using the strongest and lightest modern materials for the equipment, that the men can hope to get through."

Their acqusition of the Sinclair device is only part of the £750,000 worth of sponsorship they have already managed to raise. Products as diverse as Shell oil and Bernard Mathew's turkey breast rolls have been supplied as a result of the highly professional marketing of the expedition, and are now in a warehouse packed with equipment in London's West India Dock.

"Everything here has been given to us," says Dr Stroud, waving an arm over mountains of low-temperature clothing and two years' supply of food. "We started out with nothing. Now we've a ship and all these stores and it's all come from letters and phone calls, and gradually increasing credibility."

In return, the expedition has been able to offer their sponsors the benefit of the most rigorous field testing which any product could ever wish for, and a huge amount of highly desirable free publicity.

"We had a major press conference here a couple of weeks ago, with six TV channels and about fifty newspapers from all over the world. We've had Princess Anne down here on the ship, and we've been on *News at Ten* three or four times."

What about the QL? The expedition members are already making plans for spin-offs they can market after they come home. Apart from a film of their epic journey and an exclusive two year contract with *News at Ten,* they have also acquired a £50,000 advance from publisher Jonathan Cape for a book about the expedition. That book will be written on the Sinclair QL.

"Unfortunately," says Dr Stroud, "none of us have a clue about computers at the moment. But we're counting on the QL being easy to pick up and use, even for a beginner."

The machine will stay in the expedition's base camp and therefore will not be exposed to the hazards of sub-zero temperatures and 100 mph winds.

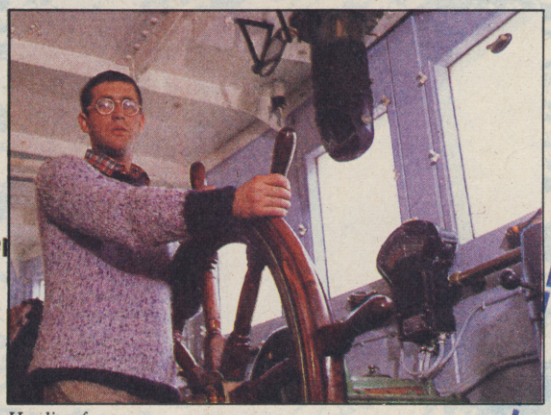
Dr Stroud explains the scientific uses he plans for the computer. "I have a whole series of observations to perform on the effect of Antarctic conditions on the human physiology.

"Obviously, I'll be looking at the changes which take place as a result of low temperatures, but I also want to examine the way the human metabolic rate adapts to changes in the amount of daylight. As the Antarctic day changes between perpetual day and perpetual night, I'll be using the QL to record and manipulate data about alterations in body temperature, in food intake and in sleeping patterns."

Many of those alterations will depend on the effects of the special food and clothing which the expedition will be taking, particularly for the two-man push to the South Pole.

"We've learned a lot from the records kept by members of the disastrous Scott expedition. One of the worst tortures they faced was the way in which perspiration from their bodies passed into their clothing and sleeping bags and then froze, so that they were eventually

continued on page 70



Heading for stormy waters . . .

Dr Stroud checks the supplies

The team's ship Southern Quest

Scott's route

Amundsen's route

South Barrier Depot

Lower Glacier Dep

Nimrod Glacier

Mt. Markham 3188m

Mt. Miller 4160m

Mt. Hope 836m

Mt. Elizabeth 4480m

The Cloudmaker 2681m

Mt. Kirkpatrick 4528m

Cloudmaker Depot

Mt. Kaplan 4230m

Beardmore Glacier

Keltie Glacier

Buckley Island

Shackleton Ice Falls

Mill Glacier

Three Degree Depot

Lt. Evans and party returned

88°23'
Shackleton's furthest south,
9th January 1909

One-and-a-half Degree Depot

Last Depot

Scott reached South Pole
17th January 1912

Amundsen reached South Pole
14th December 1911

SOUTH POLE

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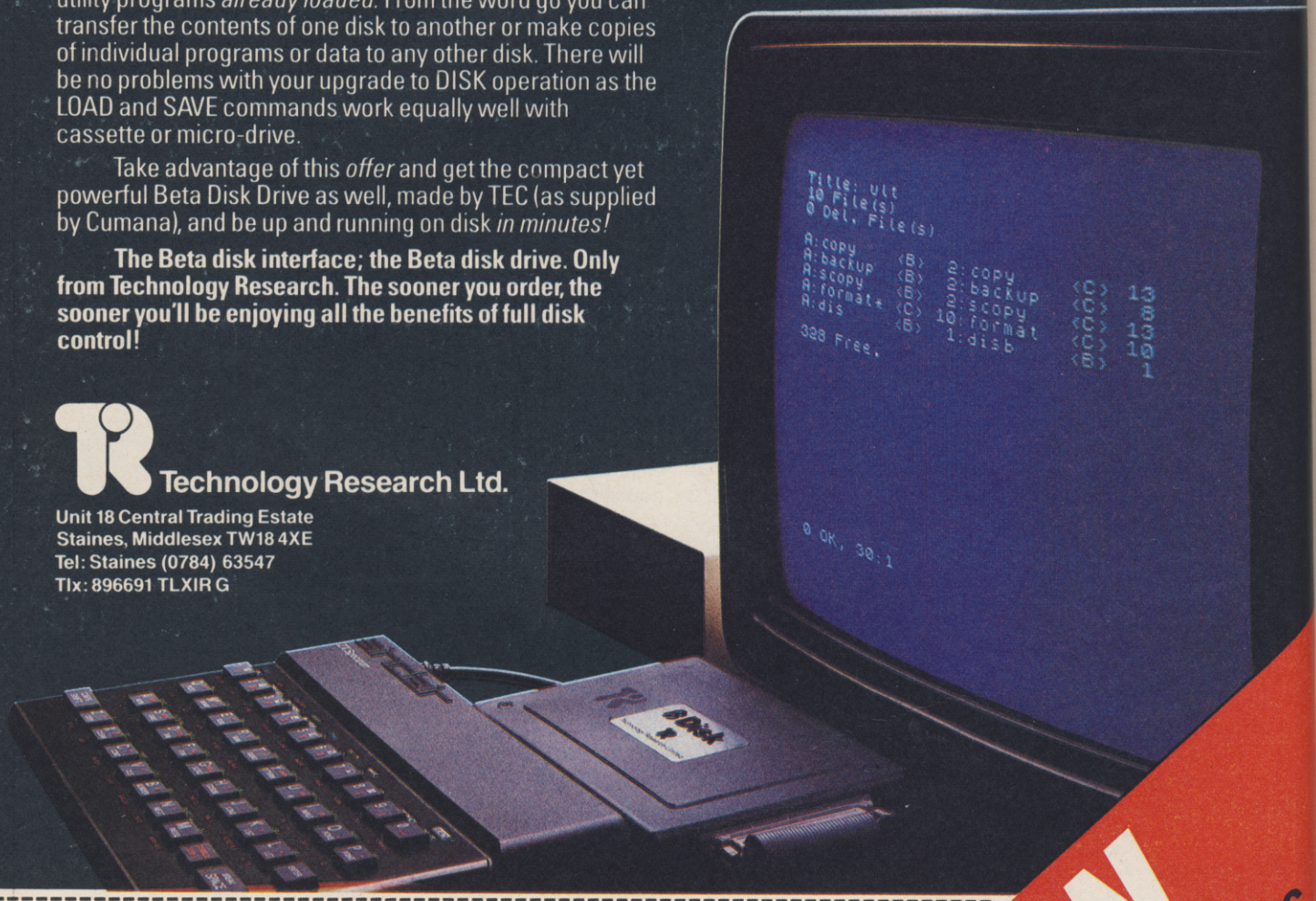

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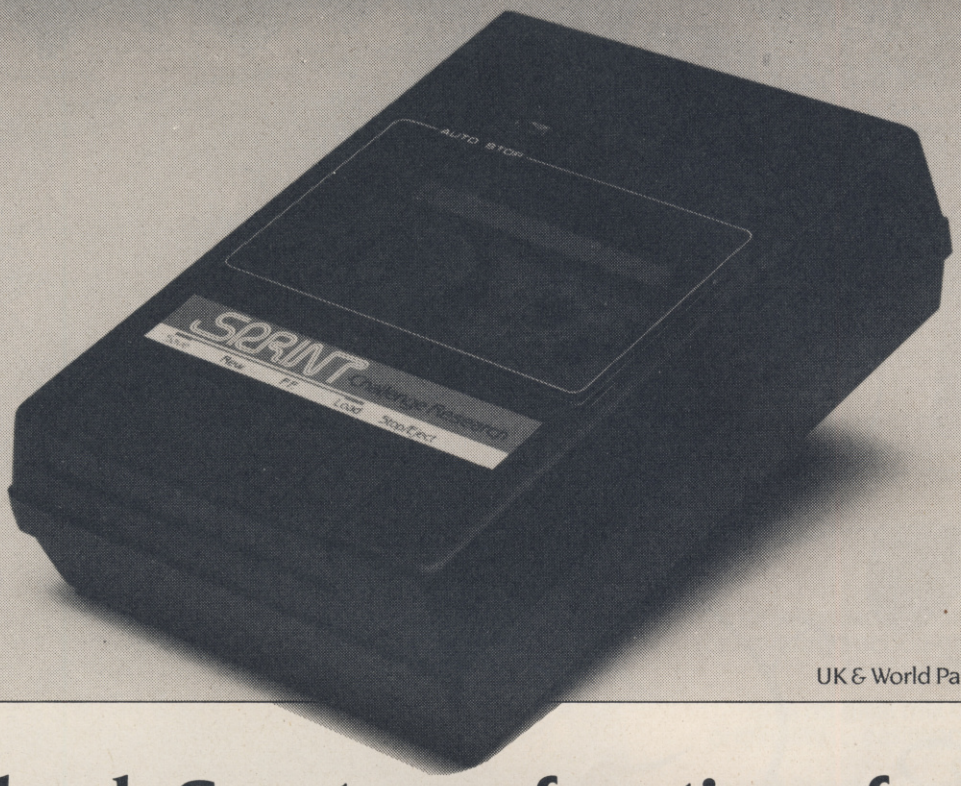

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It loads Spectrums four times faster than an ordinary cassette player, uses standard cassette software, and has improved loading reliability. All for just £64.95.

The new Sprint from Challenge Research will load and save Spectrum programs at four times the speed of conventional cassette players, this even applies to standard program and games cassette software that has been pre-recorded at normal speed. All this plus improved loading reliability is available for just £64.95 inclusive of post, packing, VAT and a 12 month guarantee. The Sprint is dedicated to both the 16K and 48K Spectrum and provides an innovative but inexpensive new concept in cassette tape storage.

Use of the Sprint is simplicity itself:

- Retains the standard Spectrum commands and format.
- Advanced digital circuitry and signal processing improves loading reliability and eliminates volume setting.
- Simply plugs into the Spectrum port – no interface or external power unit is required, it even has it's own expansion slot so that you can still use other peripherals at the same time.
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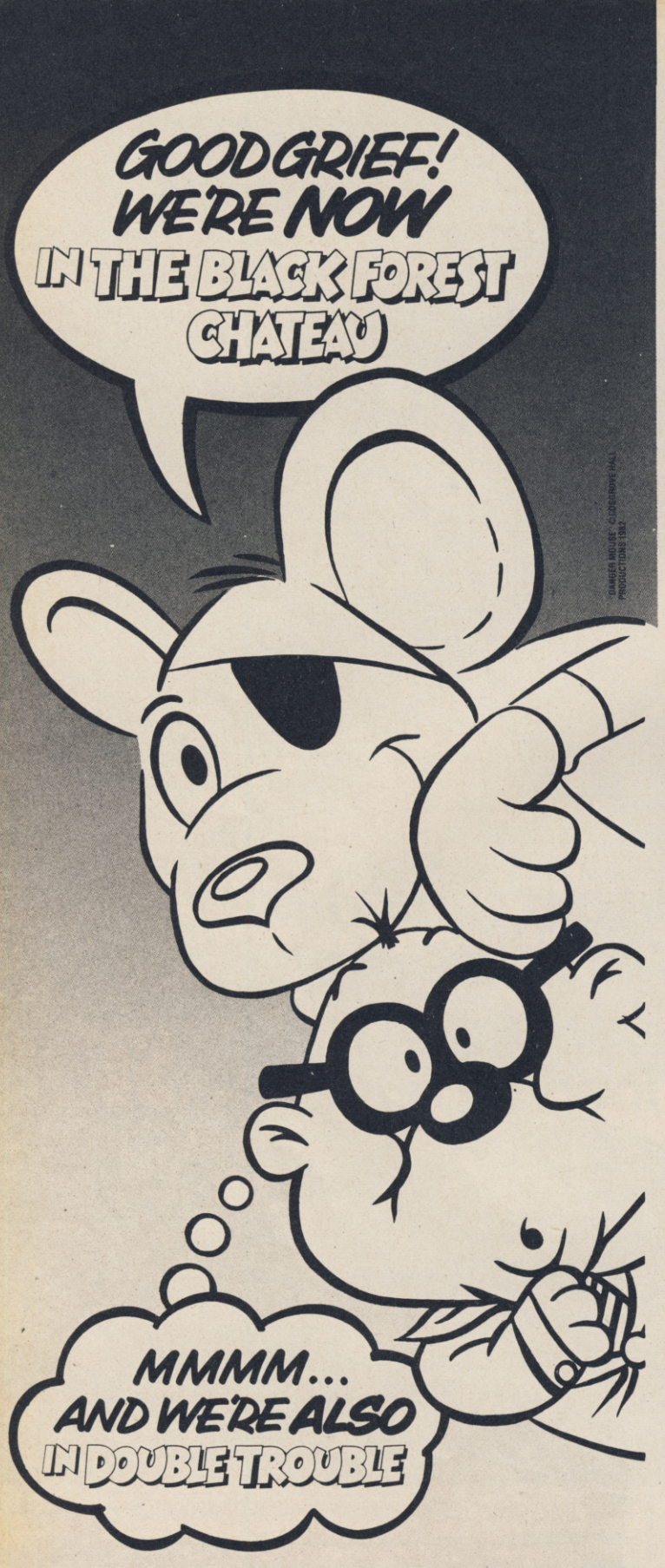

DANGER MOUSE

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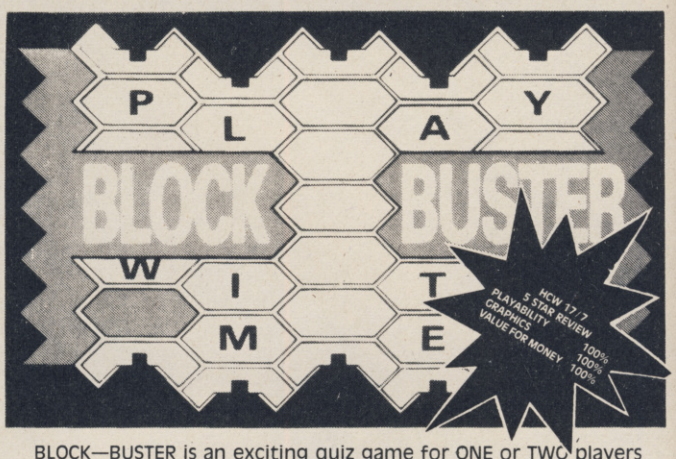

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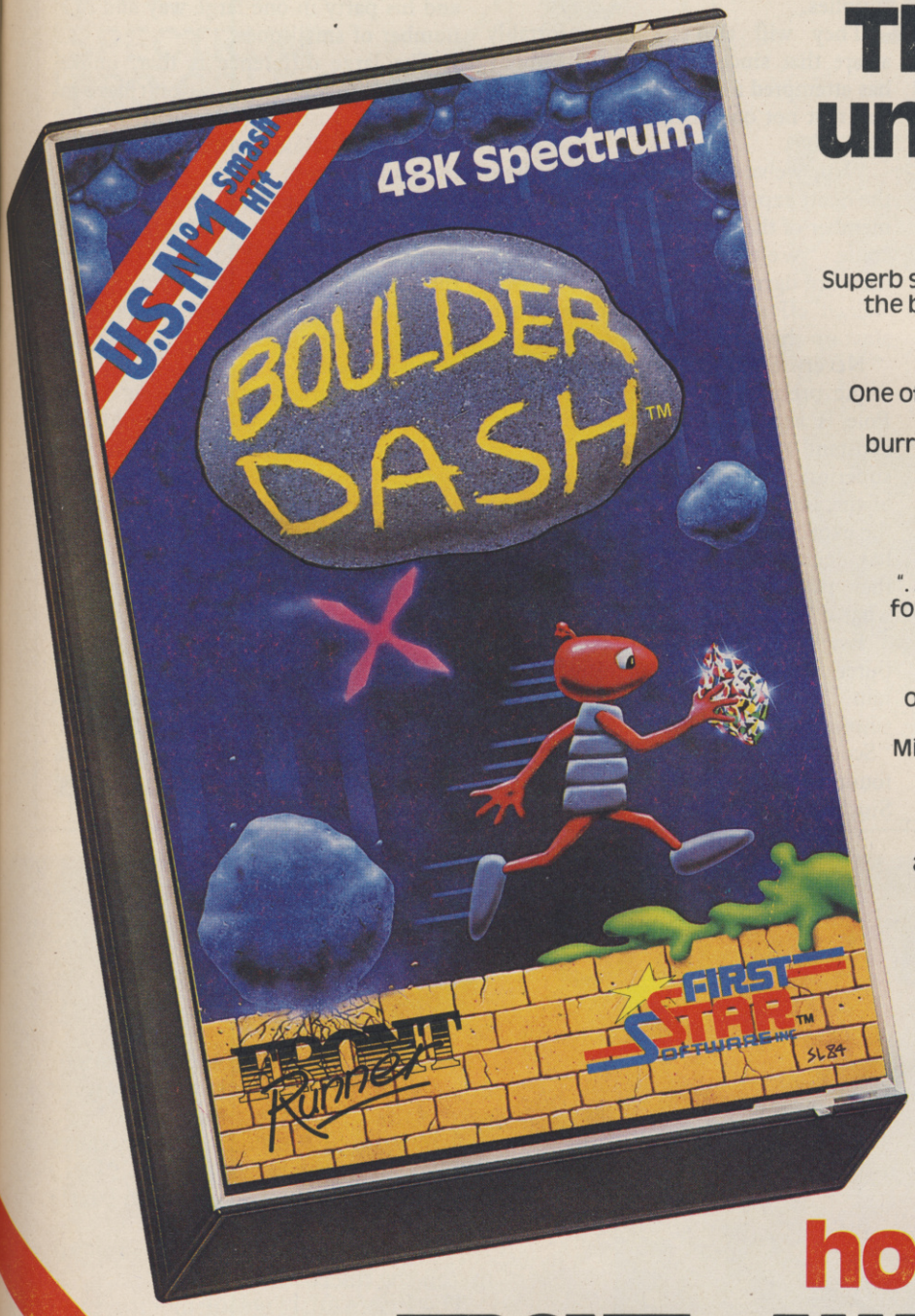

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U.S. Reviews

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Craig Holyoak **Deseret News**

"First Star has done a first-rate job on BOULDER DASH ... the graphics are dazzling ..."
The Video Game Update

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Scott Expedition

continued from page 65

carrying many pounds of ice, locked inside the goose down which was intended to protect them."

The expedition hopes to get round that problem through the use of a vapour barrier inside their insulated suits and sleeping bags. Most of the body's moisture will be trapped next to the skin by this barrier, thereby preventing the build-up of ice in their clothing, and helping to prevent dehydration in the arid Antarctic air.

"We'll probably get a bit sweaty," says Dr Stroud, "but that's certainly better than the alternative."

Dr Stroud won't be one of the two men pulling sledges to the South Pole. That dubious pleasure is reserved for Robert Swan and Roger Mead, who between them have clocked up an impressive list of qualifications for the job — things like solo bicycle rides from Cape Town to Cairo, the circumnavigation of the Icelandic ice-cap, and a winter ascent of the north face of the Eiger.

Unlike Captain Scott, they will not have the help of ponies and tractors for any stage of their journey; nor will they be able to rely on periodic stops at prearranged supply dumps. Instead, they will make the entire 883 mile journey from base camp to the Pole on their own two feet, pulling behind them two sledges containing every ounce of their supplies.

They will also be uncomfortably aware that since Scott's time, nobody has attempted a walk to the South Pole, and that not one of the Scott party got back alive.

"No, we've got no desire to imitate the Scott expedition too closely," says a member of the present enterprise with a smile. "We've all heard the story of their last days and of Captain Oates who walked off into the snow rather than slow up the expedition."

Nevertheless, their awareness of the tragic precedent for their walk to the Pole is very apparent to an outsider; constant references are made to the superiority of their equipment over that of the 1912 party, and in the galley of the expedition's ship some mordant wit has deliberately mis-spelt the label on their porridge container. "OATES" is what it says.

Even the presence of a Sinclair computer on board owes something to Captain Scott. "Dundee was the big connection here," says William Fenton. "Scott bought his ship there, and we found out that many of the parts for the Sinclair machine are made in Dundee. So we had to get a QL."

The long walk of the two modern explorers will differ from that of Scott and his party in one large way and in a number of small ones.

The large difference is that, unlike Scott and his party, they won't have to walk back. Instead, a ski plane will fly to the South Pole and collect them for the return trip to base.

"For a large part of Scott's walk he was floundering along, sinking to his knees in snow. He did have skis, but they were primitive things which kept falling apart. On our walk to the Pole, though, we'll have the best modern composite skis."

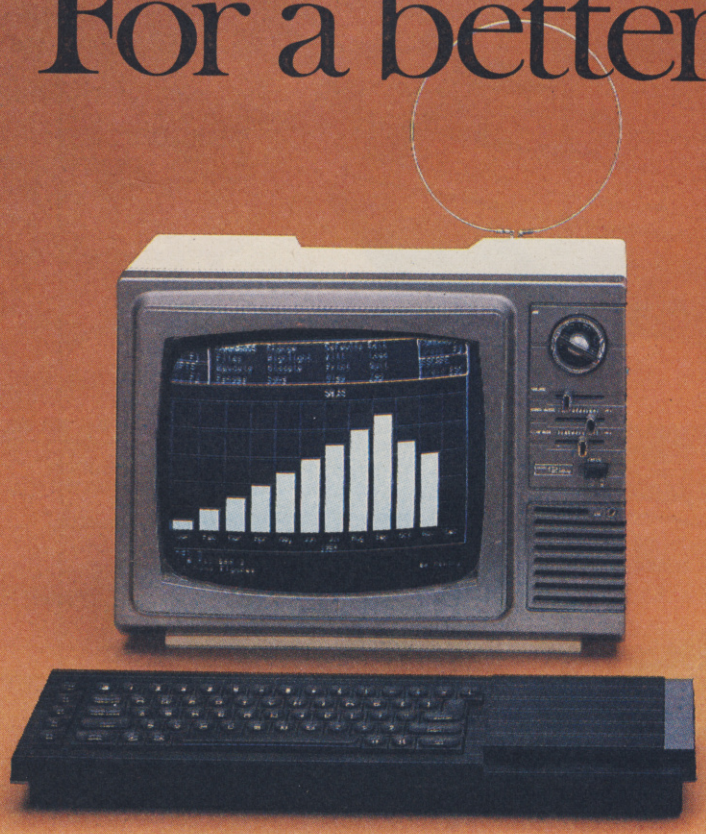
As an insurance policy, each of the two sledges will have enough supplies for both men — in case one of the sledges is lost.

The five men of the expedition will be camped on the Antarctic for a year, much of that time spent isolated from any outside contact. What will they do if their QL breaks down?

"We'll be scuppered," says Dr Stroud.

"No, it won't be as bad as that," laughs William Fenton, "We'll be able to manage by keeping written notes and by using a calculator. We'd certainly be disappointed, though."

For a better image



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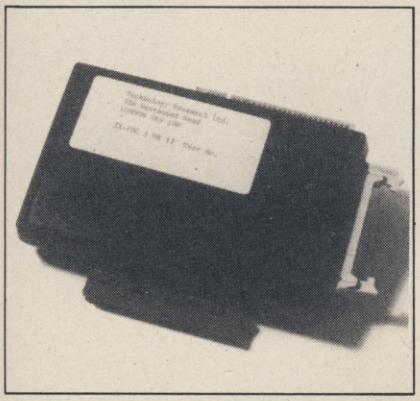

More memory less labour

In the second of our fast storage reviews, we compare the SPDOS and BETA disc systems

LAST MONTH we looked at tape-based fast storage systems for the Spectrum. This month we turn our attention to discs, one of the first and one of the latest, those from Technology Research and Watford Electronics.

The Spectrum is seen by many people as only a games machine. One of the reasons for that is the limitation of having a cassette interface. The BBC, Commodore and Amstrad can all have disc interfaces designed by the manufacturer; the Spectrum had the microdrive.

That delay caused a number of manufacturers to design disc interfaces for the Spectrum but, as yet, none has been accepted by software houses as a standard. Until that happens users will buy their software on cassette, and then convert it to use on disc.

The Beta system from Technology Research was first reviewed in *Sinclair User* in March 1984. Since then it has undergone a number of improvements and is now the best selling interface on the market. SPDOS from Watford Electronics has been released recently; it has the backing of a company which has made a name for itself by designing and selling interfaces for the BBC.

Both interfaces will accept both 5¼in and 3in drives in 40 or 80 track, single or double-side format. SPDOS can also accept old 35 track drives. Up to four drives can be used but each must have its own power supply as the Spectrum does not have any spare capacity. Many of the drives advertised as suitable for the BBC do not have a power supply and that can cost another £30.00.

The most popular system is 5¼in and discs cost between £1.75 and £3.00 each. The amount of information they can hold will vary according to the drive and the system used to record it. Both interfaces use a form of double density recording; Beta divides each track into 16 sectors of 256 bytes per sector, whereas SPDOS uses 10 sectors of 512 bytes. A 40 track, single-side drive, allowing one track for the directory, gives 156K and 195K respectively.

The speed of a system depends on several things, including the speed of the drive. All discs spin at 300 rpm, five revolutions per second — but the time it takes to move from track to track will vary. Both systems can work at a number of speeds, from 6ms to 30ms for SPDOS and 6ms to 48ms for Beta. The Beta also incorporates a one second delay, if the drive is not spinning, to allow for older, belt-driven drives to reach operating speed.

Another factor is the method of reading the sectors; Beta follows the usual practice of reading alternate sectors, so the disc has to make two revolutions per track, and SPDOS can read the sectors one after the other and so should be quicker.

The Beta interface, unusually, lies flat from the back of the Spectrum, consequently it is compatible with all full-sized keyboards. It has a through port for other add-ons and is compatible with both the Kempston E printer interface and Sinclair Interface 1. On the right is the connector for the disc drives, which follows the same standard as the BBC and has been successfully used with a BBC drive. To the left is a socket for the Spectrum power supply.

On power up you are presented with the copyright notice and an invitation to enter a password. This is the only system which uses passwords, which can be any combination of characters; if you are forgetful you could give all your discs a password corresponding to the ENTER key and so you need only press that in response to the prompt.

You are then into the DOS — Disc Operating System — and presented with:

A>

to remind you that you are in the DOS and that the default drive, the one to which all commands will relate, is the A, or number 1, drive. You can now use any of the DOS commands directly or enter Y to RETURN to BASIC. You can return to the DOS at any time by entering RAND USR 15360 but that is rarely needed.

All the normal Spectrum tape commands, apart from VERIFY, can be used by the disc: the command is simply preceded by RAND USR 15363: REM:. If PRINT USR or LET variable=USR is used then the number returned will be the error message, 0, meaning no error. Calculated parameters or variables can be used as with the tape command.

There are only two variations: by adding a third parameter when saving CODE it can be made to auto-run, and then RUN, rather than LOAD, must be used to auto-run a program. That applies to both CODE and BASIC. When LOADing and SAVEing if the second character of the file name is a colon and the first is A, B, C or D then the command is taken to apply to that drive. That is a useful way to avoid changing the default setting.

The commands that relate only to the drive are ERASE, which will erase a file, CAT, to obtain a catalogue, USR, which can be used to change the password on the disc and NEW, to change the name of a file. MOVE has a special use. When the system saves information to the disc it is stored, in the interests of speed, in successive sectors; when files are erased gaps are left and MOVE simply moves the files up to fill the

continued on page 76

Herbie Briggs has just destroyed the myth that all floppy discs are created equal.

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space. PEEK and POKE can be used to randomly read information from, and send it to, the disc. To change the default drive *"x:" is used where x is the drive. All those commands must have the usual prefix.

The utility disc supplied with the system contains two other commands: FORMAT, to format the disc, give it its password and an identifying name; and COPY to copy a single file or the whole disc in one go. If you have only one drive then prompts are given to swop the discs.

The instruction booklet gives examples of each of the commands and is written with the novice in mind. Details are also included on how to use the system from within your own machine code programs. The assembly listing included for that contains an error, having the line LD (nn),nn, which must be changed to include a register. The index at the back lists the commands, error messages and pin-outs.

The SPDOS, unlike the Beta interface, sits up vertically from the back of the Spectrum. It has a through port for add-ons but is not compatible with Interface 1. The lead for the disc is connected on the right hand side, using a disc connector onto the PCB, like the TRS80. On the top at the front is a LED and a reset button. The lead for the power supply has to be threaded through a hole in the interface. It will fit most full-sized keyboards, the only exception being the Transform which is rather high at the back.

Powering up, or pressing the reset button, automatically loads the operating system into memory. If a program has been saved with the name "AUTO", in upper case, then that will also be loaded. If the program is in BASIC and was saved using LINE then it will auto-run. CODE will auto-run from its first address.

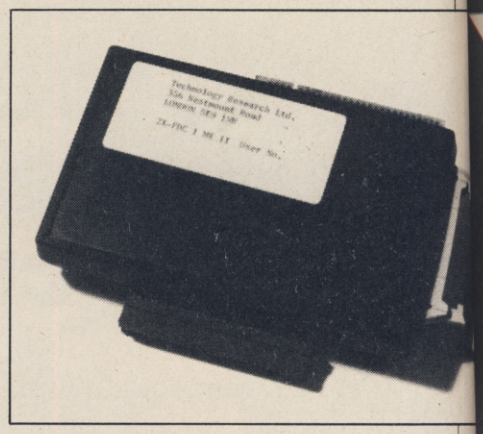
As with the Beta all the normal tape commands can be used in the usual way, apart from MERGE which will always auto-run. To make them relate to the disc they must be preceded by PRINT #4:.

The commands that relate to the disc, which must also use the PRINT #4 prefix, are: CAT, to obtain a catalogue — this can be followed by a string so that only those files containing the string are listed; CLEAR which performs a block delete; ERASE to erase a file — this includes a wild-card facility where ∧ can stand for any character; MOVE renames files or can be used to copy them.

SPDOS supports sequential files and a number of commands are used for that: OPEN # and CLOSE # are used to open and close files; PRINT # sends information while INPUT # and INKEY$ # are used to read it back. To use FORMAT the original system disc has to be in the current drive. That gives the disc its identifying name. Unlike the Beta system errors are returned as a Basic error message.

The system disc contains two other system utilities. The first of those is "copysys", a program which will copy the system, except for FORMAT, to another disc — necessary if you want to use CAT on the other disc. The other program is "minidos", a stripped down version of the system which does not, as far as is apparent, include the sequential access commands. Also on the disc is a simple address book program which shows the use of sequential files plus three commercial programs, **Tasword II, Masterfile** and **Omnicalc 2.** Those have been converted to use the system and include demonstration data.

Choosing between the two systems will depend entirely on what you want to use a disc system for. Both are very quick; using the same test program as last month that is,



```
10 FOR n=1 TO 30
20 SAVE ("test"+STR$n) CODE
32000,200
30 NEXT n
```

— and changing line 20 to suit the system, SPDOS took 58 seconds in saving, 23 loading and 29 erasing while the Beta took 55, 33 and 47 respectively. Formating depends on the number of tracks and sides; with an 80 track, single side disc SPDOS took 2 min 43 seconds and Beta 1 min 10 seconds.

If you only want to write your own programs then SPDOS with its overlays, sequential access and faster loading times has the edge.

If you also want to put your favourite commercial programs on disc then the Beta system is more suitable, unless you are into machine code. The system occupies just 112 bytes of memory below the Basic program area; it also uses the printer buffer when loading code but when doing so it saves the buffer to the disc, carries out the command, and then reloads the buffer.

Both systems allow for a large number of directory entries, Beta 128, and SPDOS 144. With the latter you have more space per disc. Both require additions to the commands, the syntax for SPDOS being slightly easier to enter from the keyboard. Both sell for similar prices, Beta £99.00 inclusive, SPDOS £99.00 plus VAT.

The winner in the contest between the disc drives will be the one which receives most software support. Both companies claim to be talking to software houses. In the meantime more systems are due to be launched. Next month we look at those, including the new system from Thurnell Electronics, priced at only £150.00 for both interface and drive.

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Psion Chess: Queen of the chequered board

QL CHESS is the most powerful game available for the QL and, not surprisingly, is produced for Sinclair Research by Psion.

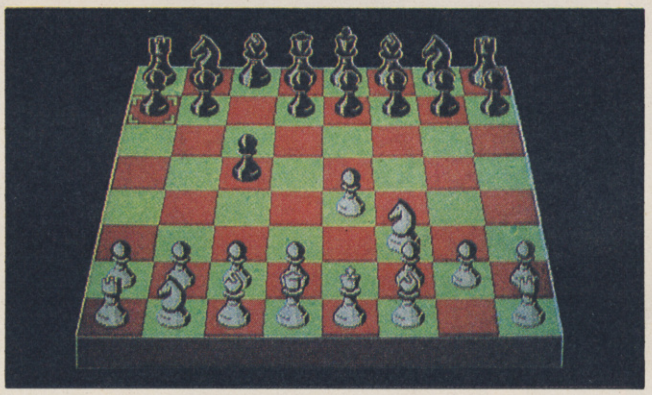
The most remarkable attribute of the package, according to Psion, is its three-dimensional representation of board and pieces. Although, on first sight, those graphics seem complex the 3D representation has been created with the minimal amount of effort by putting the board into 3D perspective. When one piece takes another it moves in front of it but when the knight, for instance, advances over a piece it moves behind.

The display is effective and watching the computer play through a demonstration will show you what can be achieved by a programmer who is more than competent on the QL.

QL Chess also has the attraction of being one of the fastest computer chess programs on the market. In Level Zero Novice Mode, for instance, it can make more than seven moves in less than a second.

The program supports a normal, birds-eye view, representation of the chess board. Psion has made the format of the display similar to the one used in its suite of business programs for the QL. The options and commands are shown at the top of the screen, the conventional view of the board at middle-right and a list of moves which are scrolled up middle-left. The list of moves can be output to a printer which will then keep a hard copy of the game as it progresses. In that way you will be able to see where you went wrong in a game or, in demo mode, how to improve your standard of play.

As our copy of the program was a preview version there were bound to be some disappointments. The major one involved the 3D screen display where the commands and options were not listed. A good memory is required if you do not want to keep moving back to the overhead 'flat' representation. Psion could have made the board smaller and incorporated a command/option panel at the bottom of the screen which would have made switching between options easier.



There are 12 levels of play which can be interchanged at any time during a game, except when the computer is thinking about a move. The first level is Zero and has been designated for the novice by the authors. It produces a simple but robust game and makes its opening move in a fraction of a second.

Any beginner will be more than flustered by the speed at which moves are made. Psion has come close to the precipice of unplayability. We are sure that the game could hold a record as one of the fastest chess games around.

The other levels range from one to 11. Level One plays at two minutes a move and Level 11 at a maximum time limit of four minutes. Above those levels Equal Time makes the computer move within the time last made by the human player and Infinite Time lifts all the restrictions of the clock. There is also a Wait option available to the human player which suspends the game. That will be useful if cheating on the clock is required.

Once you have set up the display and level to your satisfaction you can start a new game by pressing $. All the pieces are put into their initial positions and the clock starts ticking away.

Movement on the normal and 3D boards is accomplished in different ways. During 'flat' representation a cursor is moved, using the cursor keys, to a chosen piece and the ENTER key is pressed. The cursor is then moved to the new position of the piece which is then deposited on the square.

The 3D representation provides a cross-hair which is shifted using the cursor keys and which acts in the same way as the 'flat' cursor. Movement could not be easier and the list of moves is tabulated in algebraic notation. No need to enter those long formulae when you want to make a move.

If you make a move of which you are not proud you can take back the piece before the computer makes fun of your folly. There are other ways of cheating. The first, and simplest, is to use Hint which will tell you the move the computer would make in your place. It is also possible to make the QL take back the best move it can make and substitute the next best. In that way the QL can be forced to play a second-rate game and you could come out on top.

Psion has also built an option into the game which allows you to see the strategy the QL is taking. The Analysis option displays the moves which the computer considers before making its final choice and it will give you some idea of the patterns being created in the game.

QL Chess is likely to take a well-deserved place in the history of computer chess. It could rank with such names as Sargon and Sci-Sys which, undoubtedly, it could outplay if only in terms of speed.

The QL is an ideal chess machine and the software which Psion authors have written to maximise its powers is state of the art. The game's prowess has already been demonstrated at the European Chess Championships in Scotland and its usefulness to someone seriously interested in chess is undeniable. It can beat the masters.

Psion has also thought of the beginner. There is a full set of Help routines within the program. These should answer most queries of a technical or general nature.

If you own a QL then QL chess should certainly occupy a place in your software library, even if it keeps giving you a sound thrashing. The style and quality of the product would make it attractive at double the outlay.

It is also the first program which QLUB members will get at a discount price. The discount alone makes membership worthwhile.

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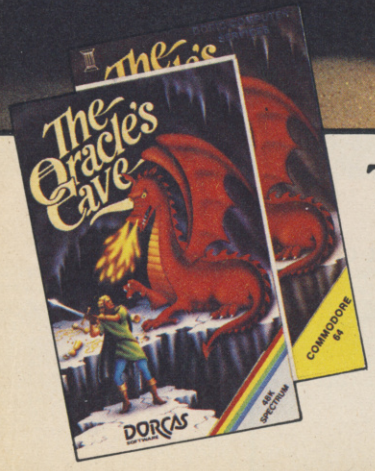

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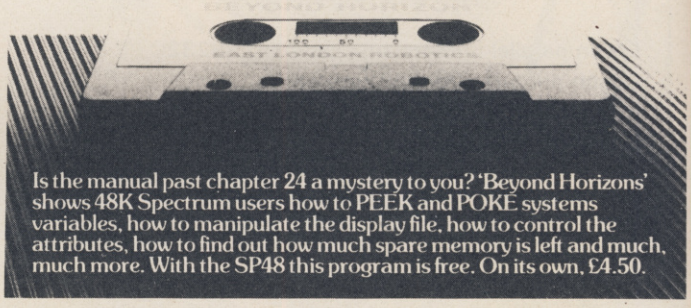

Is the manual past chapter 24 a mystery to you? 'Beyond Horizons' shows 48K Spectrum users how to PEEK and POKE systems variables, how to manipulate the display file, how to control the attributes, how to find out how much spare memory is left and much, much more. With the SP48 this program is free. On its own, £4.50.

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ZXWORD by Henry Howarth

ACROSS

6. The serious sounding micro (6)
8. Famous school gets hard disc drive (10)
10. Confusion over sin in a variety of language (7)
11. Screen speed or what the writer ate apparently (5,4)
12. Ten operations between hardware units (1,1)
13. Little piece of card punched out in Africa (4)
14. A real part of memory (4)
16. Small cathode ray tube? (3)
17. Methodical shrink employed in the computer industry? (7,7)
20. Slang, perhaps, understood by more than one computer (6,8)
25. Rush to execute a program (3)
26. Synchronization in the beginning (4)
27. Basically, keep the program (4)
28. Have real fun, initially, on the airwaves (2)
30. mV (9)
32. Move the editor when moved on screen (7)
34. Determination needed to produce 23s (10)
35. Sounds like we see facts on BBC (6)

DOWN

1. Interference on the telephone (4,5)
2. Pieces of binary (4)
3. See information on Prestel, for example (8)
4. Are they addicted to computers? (5)
5. Reset or otherwise refresh (7)
7. Or gates designed for memory (7)
9. Training organised by the C.I.A.? (3)
13. Occasion to reveal calculator company (5)
15. Language used with incomplete apple (3)
18. Room for invaders (5)
19. Fetching—like gun dogs? (9)
21. A capital metal oxide semiconductor (3)
22. A memorable place for filming, possibly (8)
23. Vivid description of display? (7)
24. Ace computer company from another planet (7)
29. All go crazy about this language (5)
31. Garbage in, garbage . . . stumped! (3)
33. Eat cards and paper tape (4)

Solution on page 192

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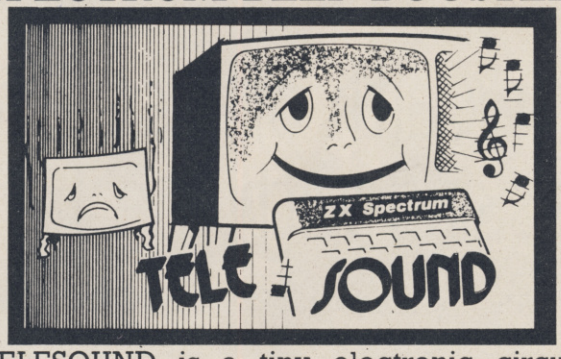

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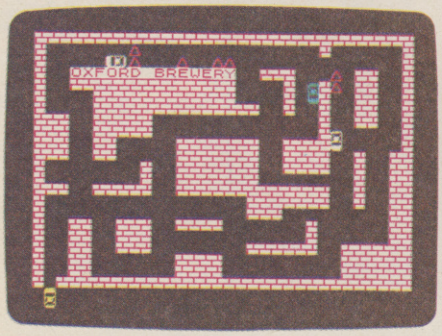

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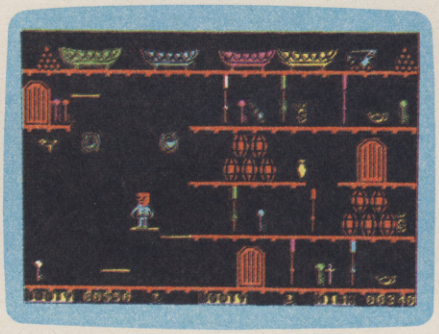
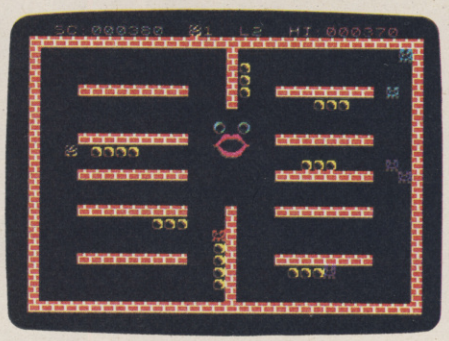
RUN BABY RUN is a demanding cop chase around five derelict locations. You, the getaway driver must dispose of six pursuing police cars and elude the seventh car's fire power to make good your escape. It's not as easy as it sounds...



BOOTY

Well shiver me timbers and splice the mainbrace and pass the grog, me hearties. Here be the greatest pirate adventure of them all, aboard that scourge of the Seven Seas – the dreaded Black Galleon. Feast yer eyes on the BOOTY-ful treasure stored in 20 holds. There be pirates, parrots and fun galore. If you don't like it, matey, we'll hang you by the highest yard-arm!!!



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Ten Crazy Caverns, ten hungry mouths to feed. Line up the Crunchy Cubes and cannon them into the Craving Craw. Watch out for the Crazy Crashers coming to convert your little Cubey Crammer into a Crushed Crisp. It's a cracker!

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PROGRAM PRINTOUT

GRAPHICS INSTRUCTIONS

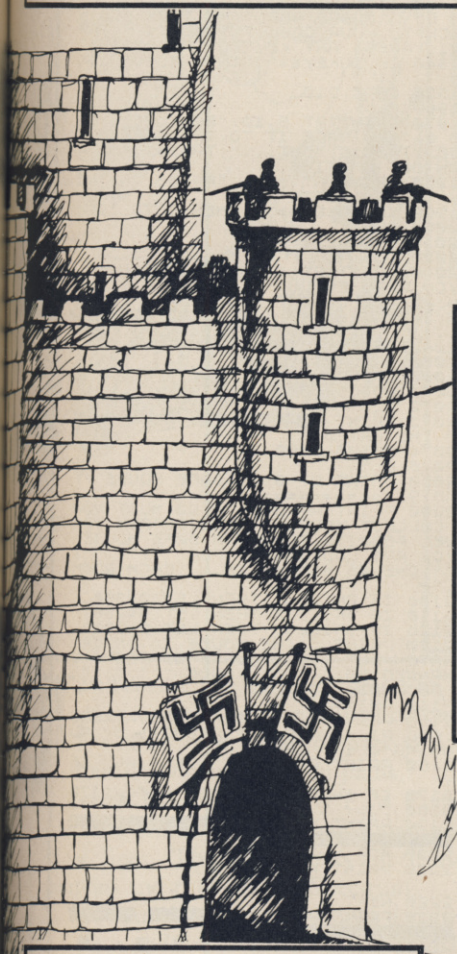
Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered.

Inverse characters are represented by the letter "i" and graphics characters by "g". Thus an inverse W would be represented by "iw", a graphics W by "gw", and an inverse graphics W by "igw".

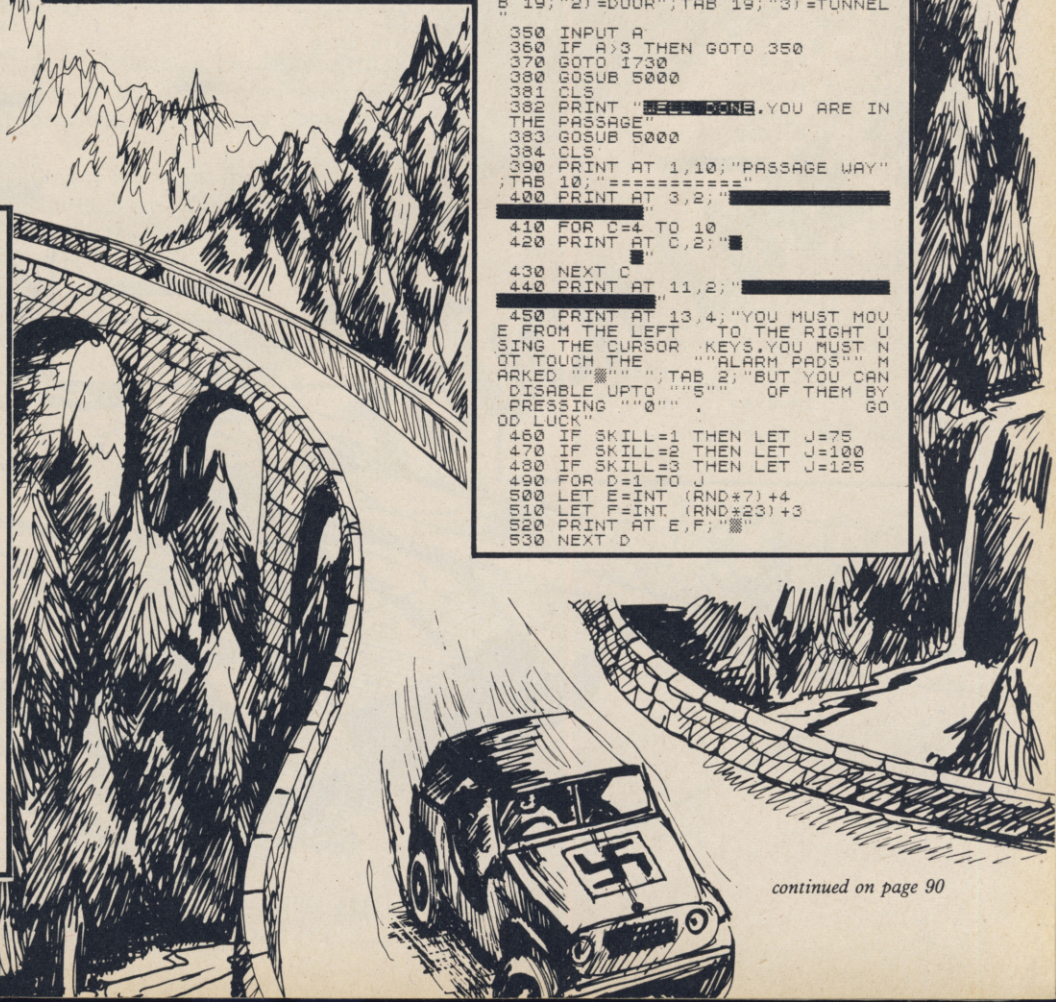
Spaces are represented by "sp" and inverse spaces by "isp". Whenever any character is to be used more than once, the number of times it is to be used is shown before it, together with a multiplication sign. Thus "6*isp" means six inverse spaces and "(g4:4*i4:g3)" would be entered as a graphic four, followed by an inverse four repeated four times, followed by a graphics three. Control codes appear with cc before the appropriate key. The are obtained by pressing Caps Shift while in Extended mode.

Where whole words are to be written in inverse letters they appear in the listings as lower-case letters. Letters to be entered in graphics mode on the Spectrum are underlined.

Inverse characters may be entered on the ZX-81 by changing to graphics mode and then typing the appropriate characters and on the Spectrum by changing to inverse video and typing the appropriate letters. Graphics characters may be entered on the ZX-81 by changing to graphics mode and then pressing symbol shift while the appropriate characters are entered. On the Spectrum graphics characters may be obtained by changing to graphics mode and then pressing the appropriate character. User-defined graphics will appear as normal letters until the program has been RUN.



```
   1 REM COLDITZ
   2 POKE 16510,0
  10 CLS
  20 DIM B$(1,11)
  30 PRINT AT 0,12;"COLDITZ";TAB
 12;"======="
  40 PRINT ,,"  YOU HAVE BEEN CA.
PTURED BY THE GERMANS AND ARE A
PRISONER OF   WAR AT COLDITZ CAS
TLE   "
  50 PRINT ,,"  YOUR OBJECTIVE A
S A PRISONER  IS TO ESCAPE"
  60 PRINT AT 10,0;"PLEASE INPUT
 SKILL LEVEL"
  70 PRINT ,,"      1=EASY";TAB 5
;"2=MEDIUM";TAB 5;"3=HARD"
  80 INPUT SKILL
  90 IF SKILL>3 OR SKILL<1 THEN
GOTO 80
 100 LET B$(1)="PLEASE WAIT"
 110 PRINT
 120 PRINT
 130 FOR N=1 TO 11
 140 PRINT B$(1,N);" ";
 150 FOR Z=1 TO 10
 160 NEXT Z
 170 NEXT N
 180 PRINT AT 19,3;"PRESS ANY KE
Y TO ESCAPE"
 181 FOR A=0 TO 15
 182 PRINT AT 21,12;"GOOD LUCK"
 183 PRINT AT 21,12;"GOOD LUCK"
 184 NEXT A
 190 IF INKEY$="" THEN GOTO 190
 200 CLS
 210 CLS
 220 PRINT AT 0,9;"PRISON CELL";
TAB 9;"==========="
 230 PRINT
 240 PRINT AT 3,2;"████████████████
██"
 250 FOR F=4 TO 10
 260 PRINT AT F,2;"█
 █"
 270 NEXT F
 280 PRINT AT 11,2;"████████████████
███"
 290 PRINT AT 6,2;" "
 300 PRINT AT 7,2;" "
 310 PRINT AT 8,2;" "
 320 PRINT AT 8,12;"O"
 330 PRINT AT 3,19;"THIS IS YOUR
";TAB 19;"CELL. CHOOSE";TAB 19;"
ESCAPE ROUTE.";TAB 19;" "
 340 PRINT TAB 19;"1)=WINDOW";TA
B 19;"2)=DOOR";TAB 19;"3)=TUNNEL
"
 350 INPUT A
 360 IF A>3 THEN GOTO 350
 370 GOTO 1730
 380 GOSUB 5000
 381 CLS
 382 PRINT "WELL DONE.YOU ARE IN
 THE PASSAGE"
 383 GOSUB 5000
 384 CLS
 390 PRINT AT 1,10;"PASSAGE WAY"
;TAB 10;"==========="
 400 PRINT AT 3,2;"████████████████
████████████"
 410 FOR C=4 TO 10
 420 PRINT AT C,2;"█
           █"
 430 NEXT C
 440 PRINT AT 11,2;"████████████████
████████████"
 450 PRINT AT 13,4;"YOU MUST MOV
E FROM THE LEFT   TO THE RIGHT U
SING THE CURSOR  KEYS.YOU MUST N
OT TOUCH THE    ""ALARM PADS"" M
ARKED ""▒"" ";TAB 2;"BUT YOU CAN
 DISABLE UPTO ""5""   OF THEM BY
 PRESSING ""0"" .            GO
OD LUCK"
 460 IF SKILL=1 THEN LET J=75
 470 IF SKILL=2 THEN LET J=100
 480 IF SKILL=3 THEN LET J=125
 490 FOR D=1 TO J
 500 LET E=INT (RND*7)+4
 510 LET F=INT (RND*23)+3
 520 PRINT AT E,F;"▒"
 530 NEXT D
```



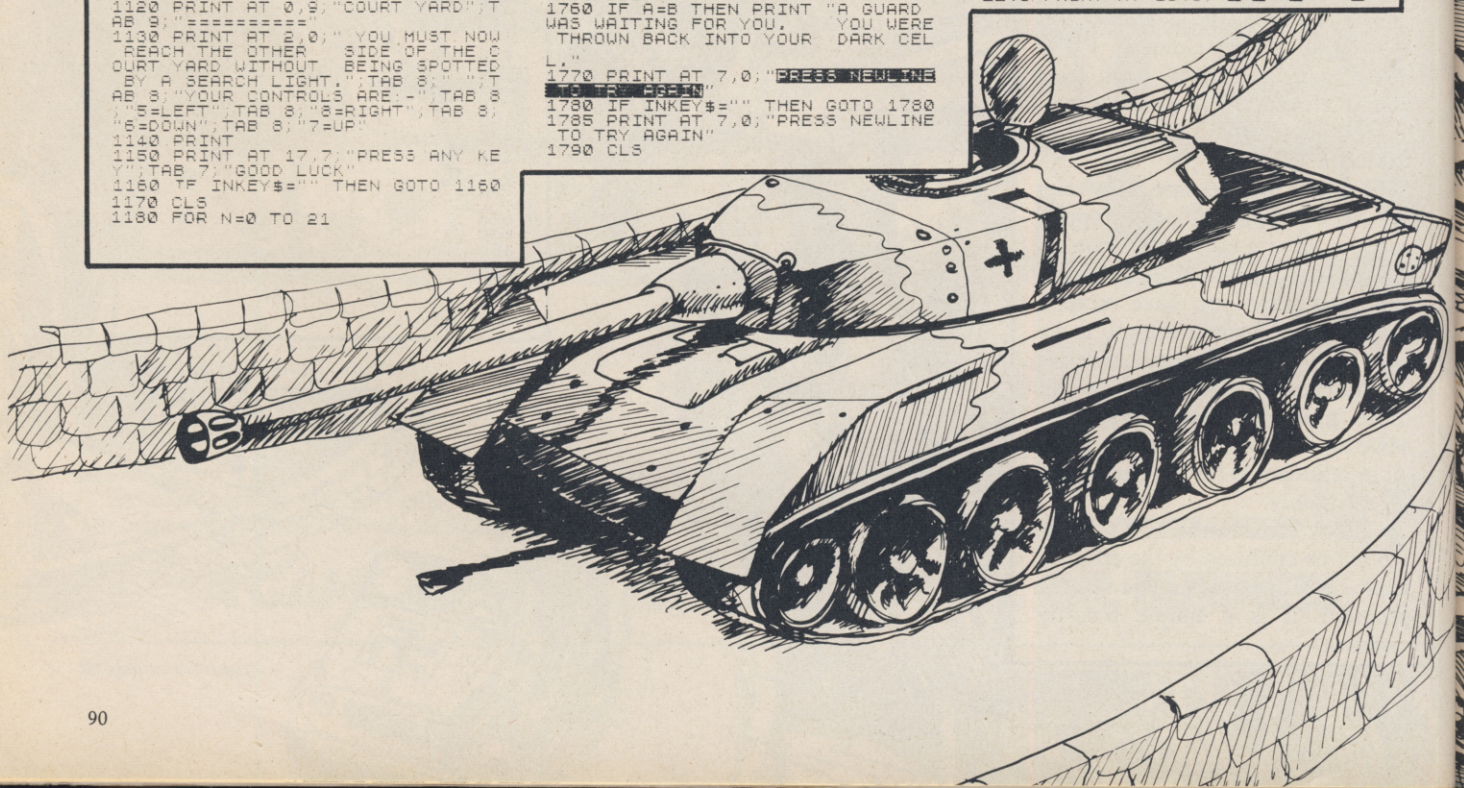
OUTWIT the guards of the notorious Colditz POW camp and win your freedom in an exciting multi-game program by Peter and Tim Bennett of Leicester.

First you must escape from your cell, then negotiate a booby-trapped corridor. There are locked doors to get through, searchlights to avoid, and even when you have escaped from the castle you must still make your way back to England. A series of different games simulate all those problems. Some are easy, some are difficult, but to win them all in sequence is for the truly great escapers only.

Colditz runs on the 16K ZX-81. Do not be confused by the effect of Line 2 on Line 1 when you run the program: it is a simple security measure.

continued on page 90

```
 540 SLOW
 550 LET Q=0
 560 LET G=4
 570 LET H=3
 580 LET G1=G
 590 LET H1=H
 600 IF INKEY$="8" THEN LET H=H+
1
 610 IF INKEY$="7" THEN LET G=G-
1
 620 IF INKEY$="6" THEN LET G=G+
1
 630 IF INKEY$="5" THEN LET H=H-
1
 640 IF INKEY$="0" AND Q<6 THEN
PRINT AT G,H+1;" "
 650 IF INKEY$="0" THEN LET Q=Q+
1
 660 IF G=3 THEN LET G=G+1
 670 IF G=11 THEN LET G=G-1
 680 IF H=2 THEN LET H=H+1
 690 LET I=PEEK 16396+256*PEEK 1
6397+1
 700 PRINT AT G1,H1;" "
 710 LET POS=PEEK (I+33*G+H)
 720 IF H=26 THEN GOTO 750
 730 IF POS=CODE "▒" THEN GOTO 1
810
 740 PRINT AT G,H;"P"
 750 GOTO 580
 760 GOSUB 5000
 761 CLS
 762 PRINT "WELL DONE.YOU ARE AT
THE LOCK"
 763 GOSUB 5000
 764 CLS
 770 PRINT AT 0,12;"LOCK";TAB 12
;"===="
 780 PRINT AT 3,1;"AT THE OTHER
SIDE OF THIS DOOR IS A COURT YAR
D,YOU MUST CROSS  THIS,BUT  FIRST
,YOU MUST UNLOCK  THE DOOR.
                  THE NUMBER IS
BEWEEN 10 AND 100 IT HAS NO SIMI
LAR DIGITS        SO,""33"" CANN
OT OPEN IT"
 810 PRINT ,,,,"PRESS ANY KEY TO
CONTINUE"
 820 IF INKEY$="" THEN GOTO 820
 830 CLS
 835 PRINT AT 0,13;"LOCK";TAB 13
;"===="
 840 PRINT AT 10,4;"▒▒▒▒▒▒▒▒▒▒"
 850 PRINT AT 18,4;"▒▒▒▒▒▒▒▒▒▒"
 860 FOR N=11 TO 17
 870 PRINT AT N,4;"▒▒▒▒▒▒▒▒▒▒"
 880 NEXT N
 890 PRINT AT 12,6;"▒▒▒▒▒▒"
 900 PRINT AT 14,6;"▒▒▒▒▒▒"
 910 PRINT AT 16,6;"▒▒▒▒▒▒"
 920 PRINT AT 14,18;"▒▒▒▒▒▒"
 930 PRINT AT 15,18;"▒▒▒▒▒▒"
 940 PRINT AT 16,18;"▒▒▒▒▒▒"
 950 LET E=0
 960 LET A=INT (RND*9)
 970 LET B=INT (RND*9)
 980 IF A=B THEN GOTO 970
 990 LET C=A*10+B
1000 FOR N=0 TO 10
1010 LET D$=INKEY$
1020 IF D$="" THEN GOTO 1010
1030 LET D=VAL D$
1040 IF D=E THEN GOTO 1010
1050 PRINT AT 15,20;E
1060 PRINT AT 15,22;D
1070 IF E*10+D<(C+(6/SKILL)) AND
 E*10+D>(C-(6/SKILL)) THEN GOTO
1110
1080 LET E=D
1090 NEXT N
1100 GOTO 1850
1110 GOSUB 5000
1111 CLS
1113 PRINT "WELL DONE. YOU UNLOC
KED THE DOOR"
1114 GOSUB 5000
1115 CLS
1120 PRINT AT 0,9;"COURT YARD";T
AB 9;"==========="
1130 PRINT AT 2,0;" YOU MUST NOW
 REACH THE OTHER  SIDE OF THE C
OURT YARD WITHOUT  BEING SPOTTED
 BY A SEARCH LIGHT.";TAB 8;" ";T
AB 8;"YOUR CONTROLS ARE:-";TAB 8
;"5=LEFT";TAB 8;"8=RIGHT";TAB 8;
"6=DOWN";TAB 8;"7=UP"
1140 PRINT
1150 PRINT AT 17,7;"PRESS ANY KE
Y";TAB 7;"GOOD LUCK"
1160 IF INKEY$="" THEN GOTO 1160
1170 CLS
1180 FOR N=0 TO 21
1190 PRINT AT N,0;"▒▒▒▒▒▒▒▒▒▒▒▒
▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
1200 NEXT N
1210 LET G=21
1220 LET H=INT (RND*21)
1230 FOR N=0 TO SKILL
1240 LET F=INT (RND*21)
1250 LET D=INT (RND*31)
1260 PRINT AT F,D;"▒"
1270 NEXT N
1280 LET G1=G
1290 LET H1=H
1300 PRINT AT G1,H1;"▒"
1310 IF INKEY$="5" THEN LET H=H-
1
1320 IF INKEY$="8" THEN LET H=H+
1
1330 IF INKEY$="6" THEN LET G=G+
1
1340 IF INKEY$="7" THEN LET G=G-
1
1350 LET I=PEEK 16396+256*PEEK 1
6397+1
1360 LET POS=PEEK (I+33*G+H)
1370 IF POS=CODE "▒" THEN GOTO 1
910
1380 PRINT AT G,H;"P"
1390 IF G=0 THEN GOTO 1410
1400 GOTO 1240
1410 GOSUB 5000
1411 CLS
1413 PRINT "WELL DONE. YOU CROSS
ED THE YARD"
1414 GOSUB 5000
1415 CLS
1420 PRINT AT 0,9;"DRIVE WAY";TA
B 9;"========="
1430 PRINT AT 2,1;"YOU MUST NOW
GET DOWN THE..... MINED DRIVE AN
D THEN YOU ARE   ALMOST FREE."
1440 PRINT " YOU ARE A ""P"" AND
 THE MINES ARE""▒"""
1450 PRINT " YOUR CONTROLS ARE:-
";TAB 9;"""8""=RIGHT";TAB 9;"""5
""=LEFT"
1460 PRINT AT 17,4;"PRESS ANY KE
Y TO CONTINUE"
1470 IF INKEY$="" THEN GOTO 1470
1475 CLS
1480 LET C=CODE "▒"
1490 LET A=CODE " "
1500 LET F=A
1510 LET B=CODE "+"
1520 LET N=CODE "▒"
1530 LET X=CODE "▒"
1540 LET Y=X
1550 FOR Q=0 TO (75*SKILL)
1560 LET Z=Y
1570 LET N=N+(SGN (CODE "▒"-INT
(RND*CODE "▒")))*(N<>A)*(N<>X)+(
N=A)-(N=X)
1580 SCROLL
1590 LET Y=Y-(INKEY$="5")+(INKEY
$="8")
1600 IF RND>.8 THEN PRINT AT B-C
,N+(INT (RND*CODE "▒")+C);"▒";TA
B 31
1610 PRINT AT B,N-C;" ▒▒▒▒▒▒ ";A
T X,Y;"P";AT X-C,Z;"▒";AT X+C,Y;
1620 LET F=F+C
1630 LET W=PEEK (PEEK 16398+PEEK
 16399*256)
1640 IF W=CODE "▒" OR W=CODE "▒"
 THEN GOTO 1670
1650 NEXT Q
1660 GOTO 1720
1670 FOR A=0 TO 50
1680 PRINT AT 10,15;"BANG"
1681 PRINT AT 10,15;"BANG"
1690 NEXT A
1700 GOSUB 5000
1710 GOTO 1910
1720 GOTO 2070
1730 LET B=INT (RND*2)+1
1740 CLS
1750 IF A<>B THEN GOTO 380
1756 CLS
1760 IF A=B THEN PRINT "A GUARD
 WAS WAITING FOR YOU.   YOU WERE
 THROWN BACK INTO YOUR  DARK CEL
L."
1770 PRINT AT 7,0;"PRESS NEWLINE
 TO TRY AGAIN"
1780 IF INKEY$="" THEN GOTO 1780
1785 PRINT AT 7,0;"PRESS NEWLINE
 TO TRY AGAIN"
1790 CLS
1800 GOTO 210
1810 CLS
1820 PRINT AT 1,1;"BAD LUCK YOU
TROD ON AN ALARM  PAD,YOU ARE NO
W BACK IN YOUR    CELL.PRESS ANY
 KEY TO TRY AGAIN"
1830 IF INKEY$="" THEN GOTO 1830
1840 GOTO 210
1850 CLS
1860 PRINT AT 0,9;"BAD LUCK";TAB
 9;"========"
1870 PRINT AT 2,1;"I FORGOT TO T
ELL YOU THAT..... YOU ONLY HAD
15 ATTEMPTS.BUT IF YOU PRESS ANY
 KEY THE GUARD   WILL TAKE YOU B
ACK TO YOUR CELL.    YOU CAN THE
N TRY AGAIN."
1880 IF INKEY$="" THEN GOTO 1880
1890 CLS
1900 GOTO 210
1910 CLS
1920 PRINT AT 0,9;"BAD LUCK";TAB
 9;"========"
1930 PRINT AT 2,0;" YOU WERE SEE
N BY A GUARD AND  HE TOOK YOU B
ACK TO YOUR CELL.";TAB 1;" ";TAB
 1;"PRESS ANY KEY TO TRY AGAIN"
1940 IF INKEY$="" THEN GOSUB 194
0
1950 GOTO 210
1960 CLS
1970 PRINT AT 5,10;"BAD LUCK";TA
B 2;"YOU MADE IT TO THE SAFE HOU
SE";TAB 12;"BUT...";TAB 4;"YOU R
AN OUT OF TIME."
1980 PRINT AT 16,4;"PRESS ANY KE
Y TO TRY AGAIN"
1990 IF INKEY$="" THEN GOTO 1990
2000 CLS
2010 GOTO 210
2020 CLS
2030 PRINT AT 4,0;"   BAD LUCK
YOU CRASHED ,     AND,A GERMA
N PATROL CAUGHT YOU      ";TA
B 3;"PRESS ANY KEY TO RETURN....
..      TO YOUR CELL"
2040 IF INKEY$="" THEN GOTO 2040
2050 GOTO 210
2060 STOP
2070 GOSUB 5000
2072 CLS
2073 PRINT "WELL DONE. YOU GOT T
O THE GATES"
2074 GOSUB 5000
2075 CLS
2080 PRINT AT 0,9;"SAFE HOUSE";T
AB 9;"==========="
2090 PRINT AT 3,0;" YOU MUST NOW
 COLLECT YOUR      NECESSARY TRA
VEL PERMITS FROM    A SAFE HOUSE.
YOU ARE LOOKING     FOR ""7"" ""*
"" ONE IS HIDDEN IN     EACH ROOM
."
2100 IF SKILL=1 THEN LET Q=300
2110 IF SKILL=2 THEN LET Q=250
2120 IF SKILL=3 THEN LET Q=200
2130 PRINT " THE HOUSE IS UNDER
WATCH BUT   THE GUARD IS BEING C
HANGED SO   YOU    HAVE """;Q;"""
 SECONDS."
2140 PRINT
2150 PRINT " USE THE CURSOR KEYS
 AND PICK   UP THE PERMITS BY RU
NNING OVER  THEM."
2160 PRINT AT 18,7;"PRESS ANY KE
Y"
2170 IF INKEY$="" THEN GOTO 2170
2180 CLS
2190 PRINT AT 1,1;"▒▒▒▒▒▒▒▒▒▒▒▒
▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
2200 FOR N=2 TO 19
2210 PRINT AT N,1;"▒
                  ▒"
2220 NEXT N
2230 PRINT AT 20,1;"▒▒▒▒▒ ▒▒▒▒▒
▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
2240 PRINT AT 19,5;"▒ ▒ ▒   ▒
```



```
2250 PRINT AT 18,5;"
2260 PRINT AT 17,5;"
2270 PRINT AT 16,7;"
2280 PRINT AT 15,9;"
2290 PRINT AT 14,7;"
2300 PRINT AT 13,2;"
2310 PRINT AT 12,9;"
2320 PRINT AT 11,2;"
2330 PRINT AT 10,7;"
2340 PRINT AT 9,7;"
2350 PRINT AT 8,2;"
2360 PRINT AT 7,9;"
2370 PRINT AT 6,2;"
2380 PRINT AT 5,8;"
2390 PRINT AT 4,8;"
2400 PRINT AT 3,8;"
2410 PRINT AT 2,8;"
2420 PRINT AT 3,4;"*"
2430 PRINT AT 9,3;"*"
2440 PRINT AT 16,3;"*"
2450 PRINT AT 16,12;"*"
2460 PRINT AT 18,23;"*"
2470 PRINT AT 8,28;"*"
2480 PRINT AT 2,22;"*"
2490 LET G=20
2500 LET H=6
2510 LET T=0
2520 FOR N=0 TO 0
2530 LET G1=G
2540 LET H1=H
2550 LET G=G+(INKEY$="6")-(INKEY
$="7")
2560 LET H=H+(INKEY$="8")-(INKEY
$="5")
2570 PRINT AT G1,H1;" "
2580 LET I=PEEK 16396+256*PEEK 1
6397+1
2590 LET POS=PEEK (I+33*G+H)
2600 IF POS=CODE "*" THEN LET T=
T+1
2610 IF POS=CODE " " THEN LET G=
G1
2620 IF POS=CODE " " THEN LET H=
H1
2630 PRINT AT G,H;"P"
2640 IF G=20 AND H=6 AND T=7 THE
N GOTO 2670
2650 NEXT N
2660 GOTO 1960
2670 GOSUB 5000
2672 CLS
2673 PRINT "WELL DONE. YOU FOUND
 THE PERMITS"
2674 GOSUB 5000
2676 CLS
2680 PRINT AT 0,9;"HELICOPTER";T
AB 9;"==========="
2690 PRINT AT 2,0;" ON YOUR WAY
HOME BY HELICOPTER YOU SEE ";3*S
KILL," BRITISH SEAMEN.       THE
Y ARE IN THE SEA AND THE     STE
RN OF THEIR TORPEDO LAUNCH   IS
GRADUALLY DISAPPEARING.        Y
OU MUST PICK THEM UP TO ....
 FINALLY GET HOME"
2700 PRINT
2710 PRINT
2720 PRINT "PRESS ANY KEY TO CON
TINUE"
2730 IF INKEY$="" THEN GOTO 2730
2740 CLS
2750 FOR N=1 TO (3*SKILL)
2760 LET L=10
2770 LET C=20
2780 LET A$=""
2790 LET D=INT (RND*4)+12
2800 CLS
2808 PRINT AT 0,10;"HELICOPTER";
TAB 10;"==========="
2810 PRINT AT 18,5;"------------
-----";AT L-1,C-1;"--+--";AT L,C;
"*";AT L+1,C+1;A$
2820 IF A$="" THEN PRINT AT 18,D
;"0"
2830 IF INKEY$="7" AND L=17 AND
C=D-1 THEN LET A$="0"
2840 IF A$="0" AND L=9 THEN GOTO
 2920
2850 IF L=18 THEN GOTO 2900
2860 LET C=C+(INKEY$="8")-(INKEY
$="5")
2870 LET L=L+(INKEY$="6")-(INKEY
$="7")
2880 PRINT AT 0,0;A$
2890 GOTO 2800
2900 PRINT "CRASH"
2910 GOSUB 5000
2911 CLS
2912 PRINT "YOU CRASHED IN THE S
EA AND HAVE BEEN KILLED"
2913 GOTO 2960
2920 NEXT N
2930 GOTO 2940
2940 CLS
2945 FOR A=0 TO 10
2950 PRINT AT 10,4;"CONGRATULATI
ONS"
2951 PRINT AT 10,4;"CONGRATULATI
ONS"
2954 NEXT A
2960 PRINT AT 7,0;"IF YOU WANT T
O PLAY AGIN PRESS    ""Y"" IF NO
T PRESS ""N"""
2970 IF INKEY$="N" THEN STOP
2975 IF INKEY$="Y" THEN RUN
2976 GOTO 2970
2980 RUN
2990 STOP
5000 FOR A=0 TO 18
5010 NEXT A
5020 RETURN
9998 SAVE "COLDIT"
9999 RUN
```

Just because you get eight draws on the Pools does not necessarily mean you scoop the jackpot. If you do one of those complicated systems with lots of different lines to check you may only end up with a handful of fourth dividends for you pains.

Touch Line Plan 32 by L M Cook of Oldham in Lancashire will not predict a winning choice but it will take out the drudgery of checking all those lines. The plan works on Littlewoods, Vernon and Zetter Pools coupons and runs on any Spectrum.

You must enter your selections according to the points they scored — 3, 2, 1.5 etc — and the program will then run through the 72 combinations and tell you what dividends, if any, you have won. Although it will only work for the specific plan, it should be possible to adapt the program for use with other systems.

TOUCH LINE 32

```
  20 BORDER 4: PAPER 4: INK 0
  30 PRINT AT 15,11; FLASH 1;"ST
OP TAPE"
  40 PAUSE 250
  50 DIM a$(18,72)
  60 LET fst=0: LET snd=0: LET t
hd=0: LET for=0: LET fif=0: LET
six=0
  70 LET pts=0
  80 DIM a(18)
  90 REM Touch line plan 32 DATA
 100 LET a$(1)="x  xx x xxxxx  x
x x xxxx            xxxxxxxx
      xxxxxxxx"
 101 LET a$(2)="xx  xx x xxxxx
xx x xxx            xxxxxxx x
                 xxxxxxxx"
 102 LET a$(3)="xxx  xx x xxxxx
 xx x xx            xxxxxx xx
      xxxxxxx x"
 103 LET a$(4)="xxxx  xx x xxxxx
  xx x x            xxxxx xxx
                 xxxxxxx x"
 104 LET a$(5)="xxxxx  xx x xxxx
x  xx x            xxxx xxxx
      xxxxxx xx"
 105 LET a$(6)=" xxxxx  xx x xxx
xx  xx x            xxx xxxxx
                 xxxxxx xx"
```

continued on page 92

continued from page 91

```
 106 LET a$(7)="x xxxxx  xx
       x  xx x xxxxxx xxxxxx
      xxxxx xxx"
 107 LET a$(8)=" x xxxxx  xx
        xx  xx x xxxx xxxxxxx
            xxxxx xxx"
 108 LET a$(9)="x x xxxxx  x
        xxx  xx x xx xxxxxxxx
      xxxx xxxx"
 109 LET a$(10)="xx x xxxxx
        xxxx  xx x x          xx
xxxxxx          xxxx xxxx"
 110 LET a$(11)=" xx x xxxxx
        xxxxx  xx x           xx
xxxxx xxxx xxxxx"
 111 LET a$(12)="  xx x xxxxx
         xxxxx  xx x          xx
xxxx xx          xxx xxxxx"
 112 LET a$(13)="             x x
xxxx  xx x xxxxx  xx          xx
xxx xxxxx xxxxxx"
 113 LET a$(14)="              x
xxxxx  xx x xxxxx  xx         xx
xx xxxx          xx xxxxxx"
 114 LET a$(15)="             x x
 xxxxx  xx x xxxxx  x         xx
x xxxxxx xxxxxxx"
 115 LET a$(16)="            xx
x xxxxx  xx x xxxxx           xx
 xxxxxx          x xxxxxxx"
 116 LET a$(17)="             xx
 x xxxxx  xx x xxxxx          x
xxxxxxx xxxxxxxx"
 117 LET a$(18)="              x
x x xxxxx  xx x xxxxx         x
xxxxxxx          xxxxxxxx"
 200 CLS
 210 PRINT "CHECK YOUR COUPON FI
RST."
 220 PRINT "Any column of 18 sel
ections      with a good chance s
hould be     noted as follows:
             List each result acc
ording to    the value of thepoin
ts, numbered1 to 18. FOR EXAMPLE
:"
 230 PRINT "1. 3
            2. 1.5
            3. 2
            4. 3      and so on."
 240 PRINT "So that the computer
 can         calculate the highes
t possible   points, first enter
the number   of score draws, no-s
core draws   and aways from the c
oupon."
 250 PRINT "When prompted, enter
 the points from your list."
 260 PRINT "ANY KEY TO CONTINUE.
"
 270 IF INKEY$="" THEN  GO TO 27
0
 280 CLS
 290 PRINT "Score draws ";
 300 INPUT "Score draws? ";scd:
PRINT scd
 310 PRINT "No-score draws ";
 320 INPUT "No-score draws? ";ns
d: PRINT nsd
 330 PRINT "Aways ";
 340 INPUT "Aways? ";aws: PRINT
aws
 360 IF scd>=8 THEN  LET pts=24:
 GO TO 430
 370 LET pts=scd*3
 380 IF scd+nsd>=8 THEN  LET x=8
-scd: LET y=x*2: LET pts=pts+y:
GO TO 430
 390 LET x=nsd*2: LET pts=pts+x
 400 IF scd+nsd+aws>=8 THEN  LET
 x=8-(scd+nsd): LET y=x*1.5: LET
 pts=pts+y: GO TO 430
 410 LET x=aws*1.5: LET pts=pts+
x
 420 LET x=8-(scd+nsd+aws): LET
pts=pts+x
 430 PRINT "MAX POINTS = ";pts
 440 DIM d(6)
 450 IF pts<24 THEN  GO TO 470
 460 LET d(1)=24: LET d(2)=23: L
ET d(3)=22.5: LET d(4)=22: LET d
(5)=21.5: LET d(6)=21: GO TO 530
 470 LET d(1)=pts
 480 LET d(2)=pts-.5
 490 LET d(3)=pts-1
 500 LET d(4)=pts-1.5
 510 LET d(5)=pts-2
 520 LET d(6)=pts-2.5
 530 PRINT "ANY KEY TO CONTINUE.
"
 540 IF INKEY$="" THEN  GO TO 54
0
 550 CLS
 560 PRINT "Enter points on winn
ing(?) line."
 570 LET x=1
 580 FOR n=2 TO 19: PRINT AT n,5
;x: LET x=x+1: NEXT n
 590 FOR n=1 TO 18
 600 INPUT "Selection points ";(
n);"  ";a(n)
 610 PRINT AT n+1,9;a(n)
 620 NEXT n: PAUSE 20
 630 PRINT "ARE THESE CORRECT? (
Y/N)"
 640 IF INKEY$="" THEN  GO TO 64
0
 650 IF INKEY$="n" THEN  GO TO 6
90
 670 IF INKEY$="y" THEN  CLS : G
O TO 730
 680 GO TO 640
 690 INPUT "Selectn. No. for Cor
tn. ";num
 700 INPUT "Correct pts. ";a(num
)
 710 PRINT AT num+1,9;"    ";AT n.
um+1,9;a(num)
 720 GO TO 640
 730 CLS
 740 FOR x=1 TO 72
 750 LET points=0
 760 FOR n=1 TO 18
 770 IF a$(n)(x TO x)="x" THEN
LET points=points+a(n)
 775 NEXT n
 780 PRINT x;TAB 5;points;" pts"
: POKE 23692,255
 790 IF points>=d(6) THEN  GO SU
B 820
 800 NEXT x
 810 GO TO 890
 820 IF points=d(1) THEN  LET fs
t=fst+1
 830 IF points=d(2) THEN  LET sn
d=snd+1
 840 IF points=d(3) THEN  LET th
d=thd+1
 850 IF points=d(4) THEN  LET fo
r=for+1
 860 IF points=d(5) THEN  LET fi
f=fif+1
 870 IF points=d(6) THEN  LET si
x=six+1
 880 RETURN
 890 PAUSE 100
 900 CLS
 910 PRINT AT 0,11;"DIVIDENDS"
 920 PRINT AT 2,8;"First  ";d(1)
;"    ";fst
 930 PRINT AT 4,8;"Second ";d(2)
;"    ";snd
 940 PRINT AT 6,8;"Third  ";d(3)
;"    ";thd
 950 PRINT AT 8,8;"Fourth ";d(4)
;"    ";for
 960 PRINT AT 10,8;"Fifth  ";d(5
);"    ";fif
 970 PRINT AT 12,8;"Sixth  ";d(6
);"    ";six
 980 PRINT AT 14,0;"PRESS 'R'  T
O CHECK ANOTHER LINE"
 990 PRINT "       Press 'S' to S
top"
1000 IF INKEY$="" THEN  GO TO 10
00
1010 IF INKEY$="r" THEN  GO TO 1
040
1020 IF INKEY$="s" THEN  STOP
1030 GO TO 1000
1040 PRINT "ANY FURTHER  WINS WI
LL  BE ADDED"
1050 PRINT "      ANY KEY TO CON
TINUE": PAUSE 10
1060 IF INKEY$="" THEN  GO TO 10
60
1070 CLS : GO TO 70
```

more programs on page 97

DO YOU WATCH TELEVISION WITH THE SOUND TURNED OFF?

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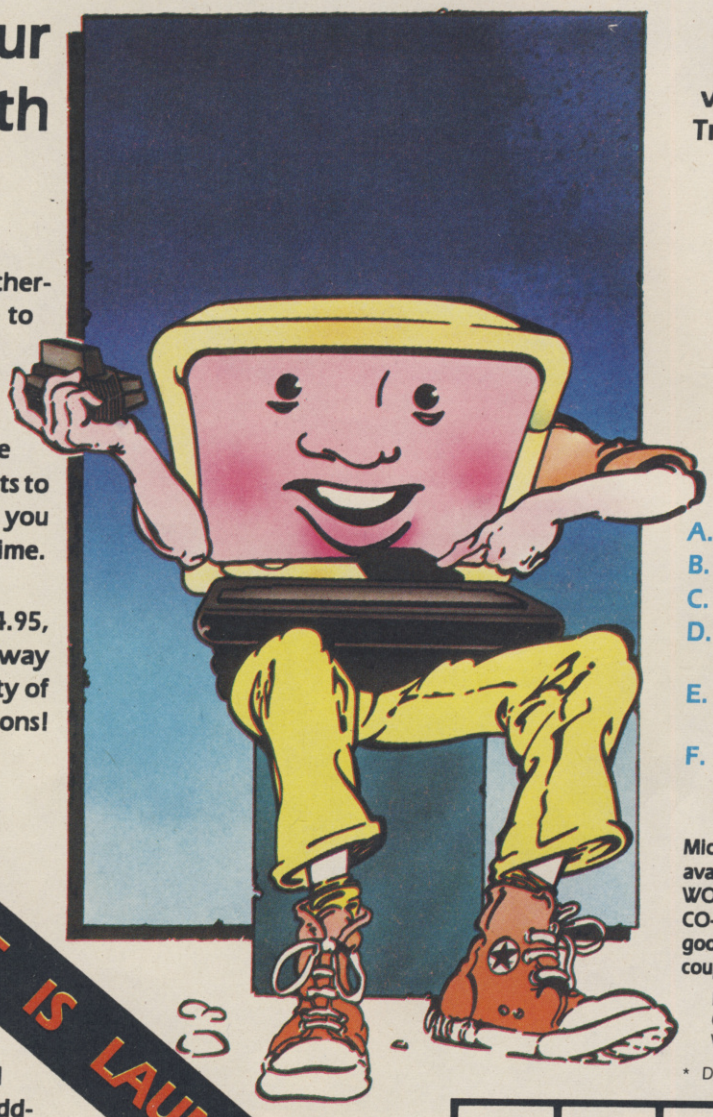

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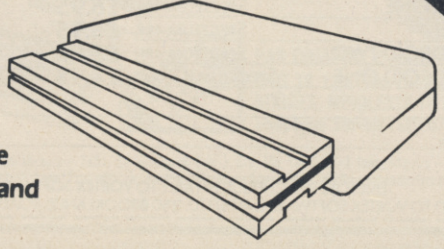

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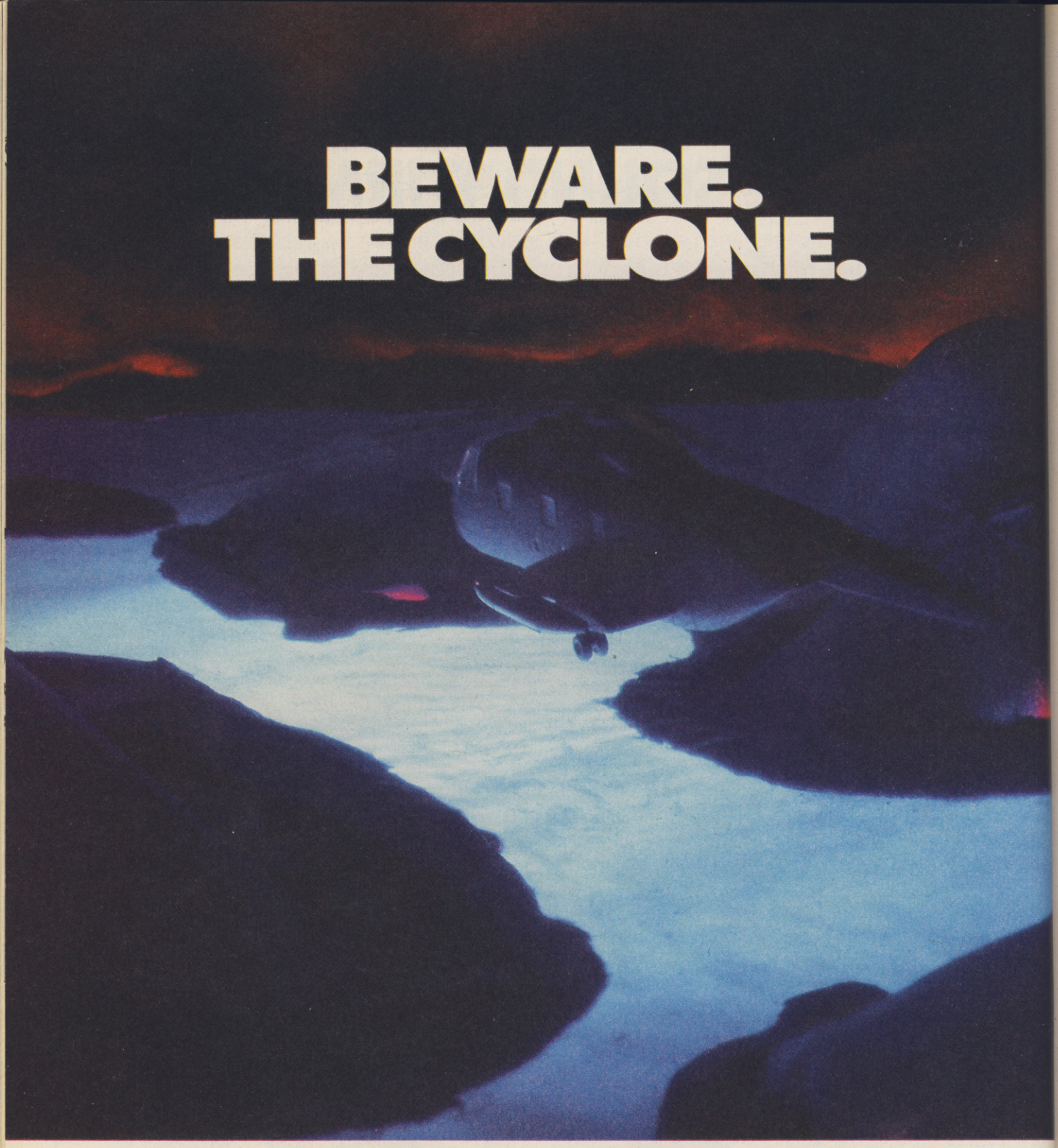

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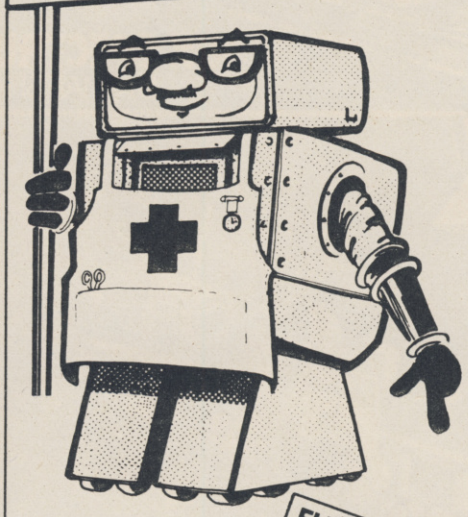

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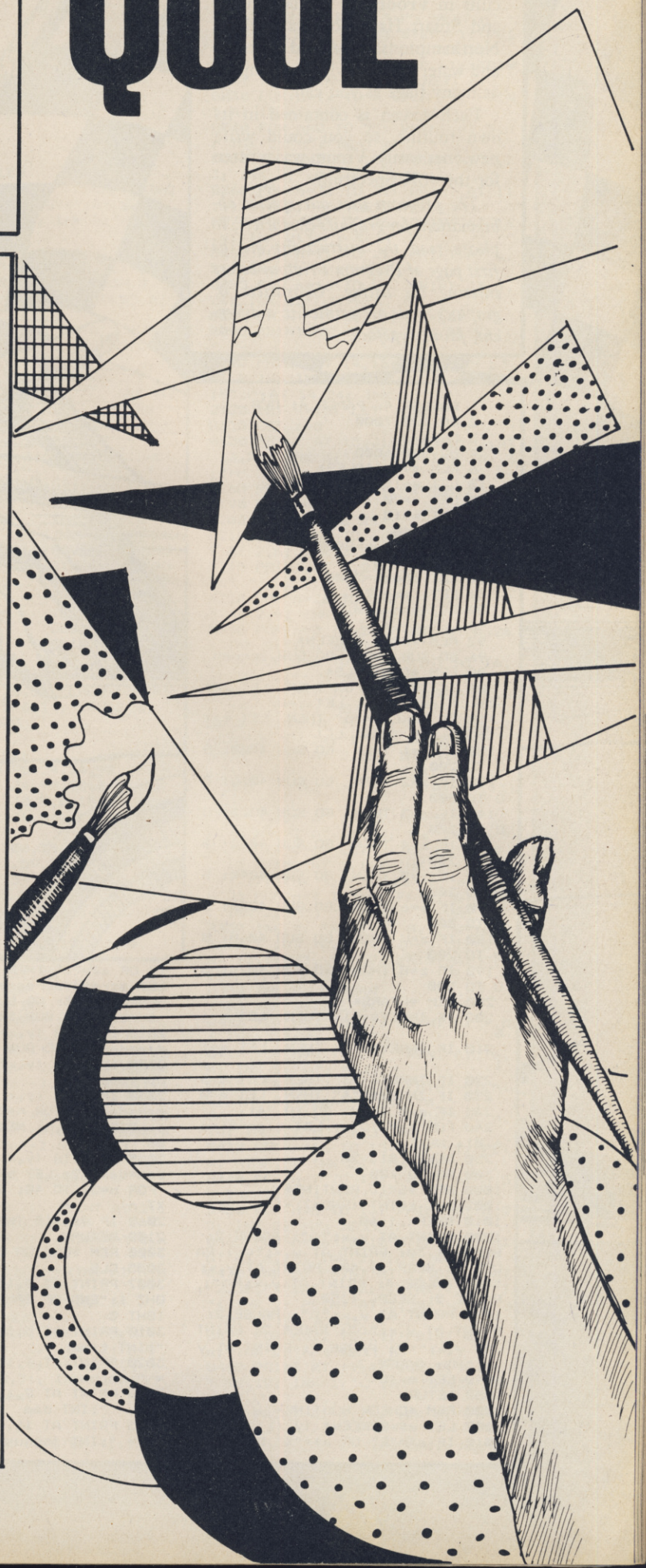
QooL

THE QL is capable of producing stunning graphics with quite simple procedures, but if you are not used to them you may find the commands a little confusing.

QooL Graphics by Neil Sampson of Oldham in Lancashire provides a series of routines to draw a variety of patterns, using BLOCK, FILL, CIRCLE and LINE commands to produce pleasing effects on the screeen.

Try running the program in both display modes in order to compare the different effects of stipple colouring in the program.

```
3 intro
4 DEFine PROCedure intro
5 WINDOW 1,512,256,0,0:SCALE 200,0,0:BORDER 4,2:PAPER
7:INK 0:CSIZE 3,1:CLS
6 PRINT"    F1-TRIANGLES"
7 PRINT"    F2-CIRCLES"
8 PRINT"    F3-LINES FROM CENTRE"
9 PRINT"    F4-LINES RANDOM"
10 PRINT"    F5-BLOCK EFFECT"
11 PRINT"    SHIFT+F1-MORE CIRCLES"
12 PRINT"     S-STOP"
13 choose
14 END DEFine intro
15 DEFine PROCedure choose
16 a=CODE(INKEY$(-1))
17 SELect a
18 =232:Triangles
19 =236:Circles
20 =240:lines_c
21 =244:lines
22 =248:beffect
23 =234:spc
24 =REMAINDER :choose
25 END SELect
26 END DEFine choose
27 DEFine PROCedure lines_c
28 CLS:FILL 0
29 REPeat loop
30 IF INKEY$="s":intro
31 INK RND(255):LINE 150,100 TO RND(300),RND(200)
32 END REPeat loop
33 END DEFine lines_c
34 DEFine PROCedure Circles
35 CLS
36 REPeat loop
37 IF INKEY$="s":intro
38 FILL 1:INK RND(255):CIRCLE RND(300),
RND(200),RND(30):FILL 0
39 END REPeat loop
40 END DEFine Circles
41 DEFine PROCedure lines
42 CLS:FILL 0
43 REPeat loop
44 IF INKEY$="s":intro
45 INK RND(255):LINE TO RND(300),RND(200)
46 END REPeat loop
47 END DEFine lines
48 DEFine PROCedure Triangles
49 CLS
50 REPeat loop
51 IF INKEY$="s":intro
52 a=RND(300):b=RND(200)
53 FILL 1:INK RND(255):LINE a,b TO RND(300),RND(200)TO
RND(300),RND(200) TO a,b:
FILL 0
54 END REPeat loop
55 END DEFine Triangles
56 DEFine PROCedure beffect
57 CLS
58 FOR r=240 TO 0 STEP -2:BLOCK r*2,r,0,0,r
59 PAUSE -1:intro
60 END DEFine beffect
61 DEFine PROCedure c2
62 SCALE 100,0,0:CLS:x=0
63 FOR r=0 TO 100
64 INK x MOD 7:x=x+1
65 IF INKEY$="s":intro
66 CIRCLE 80,50,r
67 END FOR r
68 PAUSE -1:intro
69 END DEFine c2
70 DEFine PROCedure spc
71 SCALE 1000,0,0:CLS
72 POINT 750,500
73 FOR f=0 TO 1000
74 PENUP:POINT 750,500:MOVE f:TURN f:PENDOWN
75 INK RND(255):FILL 1:CIRCLE_R,0,0,100:FILL 0
76 IF INKEY$="s":intro
77 END FOR f
78 PAUSE -1:intro
79 END DEFine spc
```



Vro

TEST DRIVE the last word in four-wheeled fury around ten different circuits in **Vroom** by Richard Judge and Stuart Harris of Scaldwell in Northamptonshire. Avoid the rocks and water hazards while picking up as many flags as you can.

Each screen is contained in its own routine, so you could write new ones easily. Vroom was written for the 48K Spectrum.

The program uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Printout before entering the listing. Characters in graphics mode are printed in a different, faint, typeface.

```
  1 BORDER 4: PAPER 4: CLS
  2 GO SUB 7000
  3 CLS
  4 GO SUB 6000
  6 REM *VARIABLES*
 10 LET x=15
 20 LET y=20
 30 LET m=18
 40 LET z=8
 45 LET screen=8000
 50 LET dam=0
 60 LET check=2000
 70 LET time=0
 80 LET bonus=0
 90 LET d=.01
 92 REM *DRAW SCREEN*
 96 GO SUB 7900: GO SUB screen
 98 REM *CONTROLS*
100 IF INKEY$="o" THEN  LET z=z
-1: IF z=0 THEN  LET z=8
110 IF INKEY$="p" THEN  LET z=z
+1: IF z=9 THEN  LET z=1
120 IF z=1 THEN  GO SUB 4000: G
O TO 200
130 IF z=2 THEN  GO SUB 4010: G
O TO 200
140 IF z=3 THEN  GO SUB 4020: G
O TO 200
150 IF z=4 THEN  GO SUB 4030: G
O TO 200
160 IF z=5 THEN  GO SUB 4040: G
O TO 200
170 IF z=6 THEN  GO SUB 4050: G
O TO 200
180 IF z=7 THEN  GO SUB 4060: G
O TO 200
190 IF z=8 THEN  GO SUB 4070: G
O TO 200
200 REM *GEARS*
202 IF INKEY$="1" THEN  LET m=1
8
210 IF INKEY$="2" THEN  LET m=1
1
220 IF INKEY$="3" THEN  LET m=5
230 IF INKEY$="4" THEN  LET m=0
235 IF m=0 THEN  GO TO 241
240 FOR n=0 TO m: LET time=time
+.01: NEXT n
250 BEEP .01,-20
300 GO TO 100
1000 REM *SKID ROUTINE*
1002 LET z=INT (RND*7)+1
1010 BEEP .1,60
1020 PRINT AT y,x;"A": PAUSE 2:
BEEP .1,30: PRINT AT y,x;"C": PA
USE 2: BEEP .1,40: PRINT AT y,x;
"E": PAUSE 4: PRINT AT y,x;"G":
PAUSE 2: BEEP .1,50
1030 PRINT AT y,x;"B": PAUSE 2:
PRINT AT y,x;"D": PAUSE 2: PRINT
 AT y,x;"F": PAUSE 2: PRINT AT y
,x;"H": PAUSE 2
1040 LET m=30
1050 RETURN
2000 REM *CHECK ROUTINE*
2002 LET a$=SCREEN$ (y,x)
2010 IF a$="E" OR a$="X" OR a$="
I" OR a$="T" THEN  GO SUB 5100:
LET screen=screen+200: LET bonus
=bonus+1000: GO SUB 7900: GO SUB
 screen: GO SUB 5400
2020 IF ATTR (y,x)=33 THEN  LET
dam=dam+1: GO SUB 1000
2030 IF ATTR (y,x)=37 THEN  GO S
UB 1000
2050 IF ATTR (y,x)=34 THEN  LET
dam=dam+2: FOR n=5 TO -25 STEP -
3: BEEP .05,n: NEXT n: GO SUB 79
00
2055 IF ATTR (y,x)=35 THEN  LET
dam=dam-.2: LET bonus=bonus+100:
 FOR n=30 TO 40: BEEP .025,n: NE
XT n
2060 IF dam>10 THEN  GO TO 3000
2100 RETURN
3000 REM *END OF GAME*
3005 CLS
3007 PRINT AT 3,10; FLASH 1; BRI
GHT 1;"END OF GAME": FLASH 0: BR
IGHT 0
3010 PRINT AT 5,1;"TIME TAKEN =
";INT time
3020 PRINT AT 7,1;"BONUS SCORED
= ";bonus
3030 PRINT AT 9,1;"DAMAGE SUSTAI
NED = ";INT dam
3035 PRINT AT 11,1;"SKILL ATTAIN
ED = ";INT (bonus/time)
3040 PRINT AT 12,1;"'BELOW 100 P
OOR',(16*sp)ABOVE 150 GOOD'"
3045 PRINT AT 20,9;"PRESS ANY KE
Y"
3050 GO SUB 5300: PAUSE 0: PAUSE
 0: GO TO 0
3998 REM *BUGGY DIRECTION*
4000 LET x=x+1: LET y=y-1: GO SU
B check: PRINT AT y,x;"H": PRINT
 AT y+1,x-1;"(sp)": RETURN
4010 LET x=x+1: GO SUB check: PR
INT AT y,x;"C": PRINT AT y,x-1;"
(sp)": RETURN
4020 LET x=x+1: LET y=y+1: GO SU
B check: PRINT AT y,x;"G": PRINT
 AT y-1,x-1;"(sp)": RETURN
4030 LET y=y+1: GO SUB check: PR
INT AT y,x;"B": PRINT AT y-1,x;"
(sp)": RETURN
4040 LET x=x-1: LET y=y+1: GO SU
B check: PRINT AT y,x;"I": PRINT
 AT y-1,x+1;"(sp)": RETURN
4050 LET x=x-1: GO SUB check: PR
INT AT y,x;"D": PRINT AT y,x+1;"
(sp)": RETURN
4060 LET x=x-1: LET y=y-1: GO SU
B check: PRINT AT y,x;"F": PRINT
 AT y+1,x+1;"(sp)": RETURN
4070 LET y=y-1: GO SUB check: PR
INT AT y,x;"A": PRINT AT y+1,x;"
(sp)": RETURN
```

```
5000 REM *TUNES*
5005 DATA .2,2,.2,7,.2,2,.2,5,.2
,2,.2,4,.1,2,.2,0,.5,0
5010 DATA .2,2,.2,7,.2,2,.2,5,.2
,2,.2,4,.1,2,.2,0,.5,0
5015 DATA .2,2,.2,9,.2,5,.2,7,.2
,14,.2,7,.2,19
5016 DATA .2,2,.2,9,.2,5,.2,7,.2
,14,.2,7,.2,19
5020 RESTORE 10
5030 FOR n=1 TO 32
5040 READ d
5050 READ p
5060 BEEP d,p
5070 NEXT n
5080 RETURN
5100 DATA .15,9,.15,11,.15,9,.15
,7,.15,9,.15,14,.15,9,.15,19
5110 RESTORE 5100
5120 FOR n=1 TO 8
5130 READ d
5140 READ p
5150 BEEP d,p
5160 NEXT n
5170 RETURN
5300 DATA .2,14,.2,2,.2,7,.2,2,.
2,7,.2,14,.2,17,.2,14,1,19
5310 RESTORE 5300
5320 FOR n=1 TO 9
5330 READ d: READ p
5340 BEEP d,p
5350 NEXT n
5360 RETURN
5400 DATA 0.1,12,.1,9,.1,7,.1,12
,.1,9,.1,7,.5,19
5410 RESTORE 5400
5420 FOR n=1 TO 7
5430 READ d: READ p
5440 BEEP d,p
5450 NEXT n
5460 RETURN
6000 REM *TITLE*
6010 PRINT AT 4,13; FLASH 1; BRI
GHT 1; INK 0;"*BUGGY*";AT 5,12;
FLASH 1; BRIGHT 1; INK 0;"*BONKE
RS*"
6020 BRIGHT 1: FLASH 1: INK 0: P
RINT AT 3,14;"*****";AT 6,11;"**
*********": BRIGHT 0: FLASH 0
6025 PRINT AT 9,3;"CONTROLS";AT
9,3; OVER 1;"________"
6030 PRINT AT 11,3;"ROTATE BUGGY
 LEFT...KEY'O'";AT 13,3;"ROTATE
BUGGY RIGHT...KEY'P'"
6040 PRINT AT 15,3;"GEARS..'1','
2','3',AND'4',          ARE ON
 THERE RESPECTIVE        KEYS"
6050 PRINT AT 20,9; FLASH 1;"PRE
SS ANY KEY": PAUSE 0: CLS
6060 PRINT AT 2,3;"INSTRUCTIONS"
;AT 2,3; OVER 1;"____________"
6070 PRINT AT 4,3;"HITTING ROCKS
  'J' MEANS A          DAMAGE FACTOR
 OF 1 . HITTING       THE BARRIER '
N' MEANS A            DAMAGE FACTOR
 OF 2,PLUS            HAVING TO RES
TART THAT             STAGE . IF TH
E DAMAGE              FACTOR IS MOR
E THAN TEN            THEN THE RACE
 IS FINISHED .        IF WATER  'KL
' IS HIT,YOU          ARE SENT INTO
 A VIOLENT            SKID . IF YOU
 HIT A FLAG 'M'       THEN IT REDUC
ES YOUR DAMAGE        BY 0.2 ."
6080 PRINT AT 20,5; FLASH 1;"PRE
SS ANY KEY TO START": PAUSE 0
6085 GO SUB 5000
6090 RETURN
6100 REM *U.D.G.*
7000 DATA 0,90,90,24,24,90,126,9
0,90,126,90,24,24,90,90,0,0,230,
64,254,254,64,230,0,0,103,2,127,
127,2,103,0,0,126,64,124,64,64,1
26,0
7010 DATA 216,200,35,155,220,14,
52,48,12,44,112,59,217,196,19,27
,27,19,196,217,59,112,44,12,48,5
2,14,220,155,35,200,216,126,198,
151,217,91,110,100,60,6,110,127,
255,255,255,63,57
7020 DATA 4,78,223,254,254,231,1
98,0,224,120,76,103,127,64,64,64
,195,255,189,255,195
7025 RESTORE 7000
7030 FOR n=0 TO 104: READ a: POK
E USR "a"+n,a: NEXT n
7040 POKE USR "n"+0,BIN 11111111
7050 POKE USR "n"+1,BIN 01000010
7060 POKE USR "n"+2,BIN 00100100
7070 POKE USR "n"+3,BIN 11111111
7080 POKE USR "n"+4,BIN 11111111
7090 POKE USR "n"+5,BIN 00100100
7100 POKE USR "n"+6,BIN 01000010
7110 POKE USR "n"+7,BIN 11111111
7120 RETURN
7900 REM *SCREEN BORDER*
7905 CLS
7910 FOR n=0 TO 31: PRINT AT 21,
n; INK 2;"(ig3)": NEXT n
7920 FOR n=0 TO 31: PRINT AT 0,n
; INK 2;"(g3)": NEXT n
7930 FOR n=0 TO 21: PRINT AT n,0
; INK 2;"(ig5)": NEXT n
7940 FOR n=0 TO 21: PRINT AT n,3
1; INK 2;"(g5)": NEXT n
7950 PRINT AT 0,0; INK 2;"(ig4)"
7960 PRINT AT 21,31; INK 2;"(ig2)"
7970 PRINT AT 21,0; INK 2;"(ig1)"
7980 PRINT AT 0,31; INK 2;"(g7)"
7990 GO TO screen
7999
8000 REM *STAGE 1*
8003 FOR n=21 TO 15 STEP -1: PRI
NT AT n,12; INK 2;"N": NEXT n
8010 FOR n=21 TO 11 STEP -1: PRI
NT AT n,18; INK 2;"N": NEXT n
8020 FOR n=18 TO 5 STEP -1: PRIN
T AT 10,n; INK 2;"N": NEXT n
8030 FOR n=12 TO 0 STEP -1: PRIN
T AT 15,n; INK 2;"N": NEXT n
8040 FOR n=0 TO 23: PRINT AT 5,n
; INK 2;"N": NEXT n
8050 FOR n=5 TO 10: PRINT AT n,2
3; INK 2;"N": NEXT n
8060 FOR n=23 TO 31: PRINT AT 11
,n; INK 2;"N": NEXT n
8070 FOR n=19 TO 26: PRINT AT 16
,n; INK 2;"N": NEXT n
8080 FOR n=11 TO 21: PRINT AT n,
31; INK 2;"N": NEXT n
8085 FOR n=16 TO 21: PRINT AT n,
26; INK 2;"N": NEXT n
8090 PRINT AT 20,13;"(5*g6)"
8095 PRINT AT 20,27; INK 0;"EXIT
"
8100 PRINT AT 14,15; INK 5;"KL";
AT 8,19; INK 5;"KL";AT 8,4; INK
1;"J";AT 14,24; INK 1;"J"
8120 LET x=15: LET y=20
8130 LET z=8
8150 PRINT AT 13,3; INK 3;"M";AT
 13,21; INK 3;"M";AT 9,10; INK 3
;"M"
8160 PRINT AT 18,19;"STAGE 1"
8190 RETURN
8200 REM *STAGE 2*
8210 FOR n=31 TO 6 STEP -1: PRIN
T AT 7,n; INK 2;"N": NEXT n
8215 PRINT AT 1,27; INK 0;"(4*ig
6)"
8220 FOR n=26 TO 0 STEP -1: PRIN
T AT 2,n; INK 2;"N": NEXT n
8230 FOR n=0 TO 2: PRINT AT n,26
; INK 2;"N": NEXT n
8240 FOR n=6 TO 31: PRINT AT 16,
n; INK 2;"N": NEXT n
8250 FOR n=7 TO 16: PRINT AT n,6
; INK 2;"N": NEXT n
8260 PRINT AT 17,30;"E";AT 18,30
;"X";AT 19,30;"I";AT 20,30;"T"
8270 PRINT AT 5,20; INK 1;"J";AT
 4,15; INK 1;"J";AT 7,4; INK 1;"
J";AT 17,10; INK 1;"J";AT 19,15;
 INK 1;"J"
8280 PRINT AT 19,2; INK 5;"KL"
8290 PRINT AT 18,20; INK 5;"KL"
8300 LET y=1: LET x=28: LET z=4
8310 PRINT AT 5,16; INK 3;"M";AT
 17,17; INK 3;"M"(cc3)
8320 FOR n=7 TO 14: PRINT AT n,2
; INK 2;"N": NEXT n
8330 INK 0: PRINT AT 8,1;"S";AT
9,1;"T";AT 10,1;"A";AT 11,1;"G";
AT 13,1;"2": INK 2: PRINT AT 7,0
;"NN";AT 14,0;"NN"
8350 INK 0: RETURN
8400 REM *STAGE 3*
8403 FOR n=5 TO 31: PRINT AT 7,n
; INK 2;"N": NEXT n
8410 FOR n=0 TO 27: PRINT AT 16,
n; INK 2;"N": NEXT n
8415 FOR n=17 TO 20: PRINT AT n,
1; INK 0;"(ig6)": NEXT n
8420 FOR n=10 TO 16: PRINT AT n,
10; INK 2;"N": NEXT n
8430 FOR n=16 TO 15 STEP -1: PRI
NT AT n,5; INK 2;"N": NEXT n
8440 FOR n=7 TO 12: PRINT AT n,5
; INK 2;"N": NEXT n
8450 FOR n=8 TO 13: PRINT AT n,2
3; INK 2;"N": NEXT n
8460 FOR n=16 TO 10 STEP -1: PRI
NT AT n,18; INK 2;"N": NEXT n
8470 INK 0: PRINT AT 1,30;"E";AT
 2,30;"X";AT 3,30;"I";AT 4,30;"T
": INK 2: PRINT AT 5,30;"N";AT 6
,30;"N";AT 6,22;"N"
8475 FOR n=22 TO 29: PRINT AT 5,
n; INK 2;"N": NEXT n
8480 PRINT AT 19,4; INK 5;"KL";A
T 18,10; INK 1;"J";AT 18,23; INK
 1;"J"
8485 PRINT AT 6,23; INK 0;"STAGE
 3"
```

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8490 LET x=1: LET y=19: LET z=2
8500 PRINT AT 17,20; INK 3;"M";A
T 14,8; INK 3;"M";AT 3,20; INK 3
;"M";AT 5,20; INK 3;"M": INK 0
8510 RETURN
8600 REM *STAGE 4*
8603 LET z=2: LET x=3: LET y=2
8615 FOR n=1 TO 4: PRINT AT n,1;
 INK 0;"(ig6)": NEXT n
8630 FOR n=0 TO 21: PRINT AT 5,n
; INK 2;"N": NEXT n
8640 FOR n=0 TO 7: PRINT AT 12,n
; INK 2;"N": NEXT n
8650 FOR n=8 TO 12: PRINT AT n,8
; INK 2;"N": NEXT n
8660 FOR n=8 TO 25: PRINT AT 17,
n; INK 2;"N": NEXT n
8670 FOR n=14 TO 21: PRINT AT n,
8; INK 2;"N": NEXT n
8680 FOR n=14 TO 16: PRINT AT n,
3; INK 2;"N": NEXT n
8690 FOR n=3 TO 7: PRINT AT 14,n
; INK 2;"N": NEXT n
8700 FOR n=17 TO 21: PRINT AT n,
25; INK 2;"N": NEXT n
8710 FOR n=13 TO 31: PRINT AT 12
,n; INK 2;"N": NEXT n
8720 FOR n=9 TO 12: PRINT AT n,1
2; INK 2;"N": NEXT n
8730 FOR n=12 TO 31: PRINT AT 9,
n; INK 2;"N": NEXT n
8740 FOR n=5 TO 9: PRINT AT n,25
; INK 2;"N": NEXT n
8750 PRINT AT 9,3; INK 5;"KL";AT
 2,19; INK 5;"KL";AT 3,27; INK 5
;"KL";AT 7,15; INK 5;"KL";AT 14,
13; INK 5;"KL";AT 15,26; INK 5;"
KL"
8760 INK 1: PRINT AT 20,30;"J";A
T 3,8;"J";AT 2,12;"J";AT 4,26;"J
";AT 7,5;"J";AT 14,18;"J";AT 17,
28;"J": INK 0
8770 INK 3: PRINT AT 4,28;"M";AT
 6,28;"M";AT 7,4;"M";AT 9,2;"M";
AT 11,2;"M";AT 11,4;"M";AT 9,6;"
M";AT 13,6;"M";AT 13,5;"M";AT 13
,4;"M";AT 13,3;"M";AT 13,2;"M";A
T 15,2;"M";AT 17,2;"M";AT 18,4;"
M";AT 16,6;"M": INK 0
8780 PRINT AT 20,26;"EXIT"
8785 PRINT AT 18,13; INK 0;"STAG
E 4";AT 20,12; INK 0;"BONUS RUN"
8798 RETURN
8800 REM *STAGE 5*
8804 LET z=4
8805 LET x=29: LET y=2
8810 FOR n=0 TO 14: PRINT  INK 2
;AT n,28;"N": NEXT n
8815 PRINT AT 1,29; INK 0;"(2*ig
6)"
8820 FOR n=6 TO 24: PRINT  INK 2
;AT 6,n;"N": NEXT n
8830 FOR n=6 TO 21: PRINT  INK 2
;AT n,24;"N": NEXT n
8840 FOR n=6 TO 24: PRINT  INK 2
;AT 15,n;"N": NEXT n
8850 FOR n=0 TO 10: PRINT  INK 2
;AT 12,n;"N": NEXT n
8860 FOR n=0 TO 19: PRINT  INK 2
;AT 19,n;"N": NEXT n
8870 FOR n=19 TO 21: PRINT  INK
2;AT n,19;"N": NEXT n
8880 PRINT AT 20,2;"HIGH SPEED T
RACK"
8890 INK 5: PRINT AT 4,18;"KL";A
T 18,20;"KL": INK 0
8900 INK 1: PRINT AT 3,6;"J";AT
10,4;"J";AT 8,16;"J";AT 15,3;"J"
: INK 0
8910 INK 3: PRINT AT 18,28;"M";A
T 11,25;"M";AT 13,11;"M";AT 14,7
;"M";AT 17,21;"M": INK 0
8920 PRINT AT 20,20;"EXIT"
8930 RETURN
9000 REM *STAGE 6*
9004 LET x=20: LET y=2: LET z=4
9005 FOR n=14 TO 31: PRINT  INK
2;AT 19,n;"N": NEXT n
9010 FOR n=0 TO 7: PRINT  INK 2;
AT n,18;"N": NEXT n
9015 PRINT AT 1,19;"(4*ig6)"
9020 FOR n=18 TO 25: PRINT  INK
```

continued on page 105

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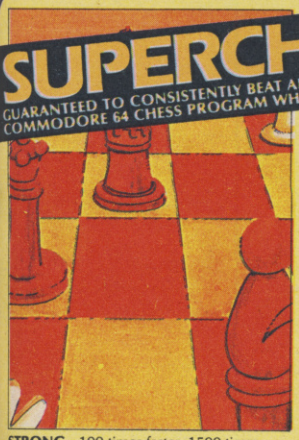

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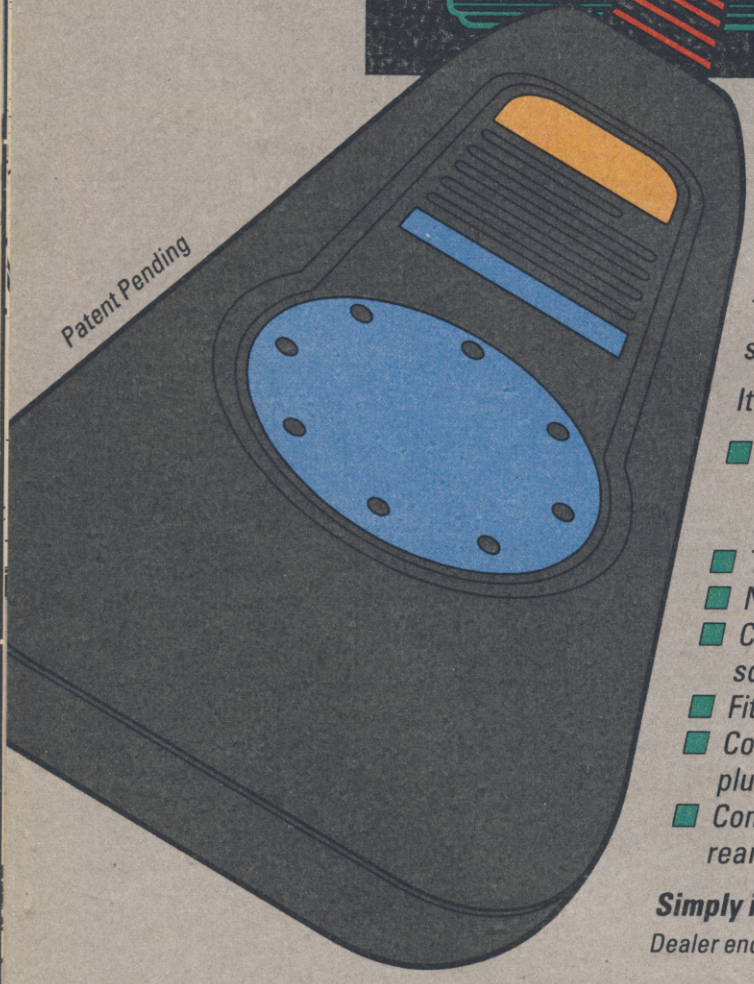

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NOTE: Release 1.0 is still available for 16/48K Spectrum at £11.00.

ALTER screens colours (general or specific)
AUTO line numbering
BREAK out of code loops
CLOCK digital clock
CURSOR CONTROL CODES allow strings to have complex shapes
DEF KEY user definable keys
DELETE a block of lines
DO-LOOP structure
DPOKE double poke
EDIT specified line
ELSE (used with IF... THEN)
EXIT leave DO-LOOP
FILL enclosed area with specified ink or paper
GET wait for keypress
JOIN two program lines
KEYIN a string
KEYWORDS new keywords on/off
LIST/LLIST line TO line
USED (used with GOTO, GOSUB)
ON ERROR trap errors (with LINE, STAT and ERROR)
PLOT a string (may contain cursor control codes)
POKE a string
POP Basic's stack
PROC, DEF PROC, END PROC (for named procedures)
RENUM versatile renumber
ROLL all or part of screen in any direction by specified number of pixels, with or without attributes
SCROLL like ROLL, but without wrap round
SORT arrays (very fast)
SPLIT program lines
TRACE program execution
UNTIL used with DO or LOOP
USING used with PRINT
WHILE used with DO or LOOP
XOS, YOS move PLOT origin
XRG, YRG change PLOT scale

FUNCTIONS

AND (bit-by-bit)
BIN£ decimal to binary
CHAR$ number to 2 characters
COS£ fast cosine
DEC hexadecimal to decimal
DPEEK double PEEK
FILLED filled area
HEX$ decimal to hexadecimal
INSTRING string search
MEM free memory
MEMORY$ all of memory as a string
MOD modules
NUMBER 2 characters to number
OR (bit-by-bit)
RND# fast RND
SCRN$ recognises user graphics
SIN£ fast sine
STRING$ repeats strings
TIME$ current time
USING$ formats numbers
XOR (bit-by-bit)

Only £11.00 inclusive! (Upgrade price for Release 1.0 owners is £4.00. This includes a 12-page supplement to your manual. Please quote date of purchase. If you did not purchase from us, state supplier and return original cassette.)

Please send me:
Beta Basic, Release 1.8. Payment of £11.00 is enclosed.
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Athlete
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Super Bridge
For beginners and experts alike. Designed to give above average players a good run for their money and to give beginners an excellent introduction without the worry of an impatient partner.

Make Music
A music synthesizer program designed to compose 3-part harmonies when used with the Zon, Fuller and Timedata sound boxes or any other using the AY-3-8912 chip where the 'OUT' command is known. 'Brilliant' – ZX Computing.

Buffer Adventure
Featuring the real-life characters who work at Buffer Micro. Dare you unravel the mysteries behind the shop? Are the people who serve you quite as weird as they seem? An amusing, pun-laden adventure.

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All the fun of the fair, plus unimaginable terrors in the House of Horror and the Ghost Train before you can find the five items of treasure hidden somewhere in the Fairground.

Pools Predictions
Score draws, no-score draws, home and away wins in this menu-driven program to help you fill in that winning coupon. English/Scottish leagues and Australian leagues for all year round success.

Racing Predictions
Covers the flat racing season at the touch of the keyboard – all the major courses catered for in this user friendly prediction program. Pick the first three home with confidence – not a pin!

Card Games
CRIBBAGE is the most fascinating of this series, produced in response to Cribbage addicts' requests. Also on the same cassette are PAIRS, BINGO and PATIENCE.

Loony Bin
Mad adventure requiring cool logical thinking to escape from the asylum and travel the world following the clues. Uses all but 8 bytes of the Spectrum's 48k memory.

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continued from page 100

```
2;AT 7,n;"N": NEXT n
9030 FOR n=7 TO 9: PRINT  INK 2;
AT n,25;"N": NEXT n
9040 FOR n=0 TO 2: PRINT  INK 2;
AT n,25;"N": NEXT n
9050 FOR n=23 TO 31: PRINT  INK
2;AT 2,n;"N": NEXT n
9060 FOR n=4 TO 17: PRINT  INK 2
;AT n,3;"N": NEXT n
9070 FOR n=3 TO 13: PRINT  INK 2
;AT 4,n;"N": NEXT n
9080 FOR n=4 TO 12: PRINT  INK 2
;AT n,13;"N": NEXT n
9090 FOR n=13 TO 31: PRINT  INK
2;AT 12,n;"N": NEXT n
9100 FOR n=9 TO 21: PRINT  INK 2
;AT n,8;"N": NEXT n
9110 FOR n=8 TO 25: PRINT  INK 2
;AT 15,n;"N": NEXT n
9120 FOR n=19 TO 21: PRINT  INK
2;AT n,13;"N": NEXT n
9130 FOR n=0 TO 2: PRINT  INK 2;
AT n,8;"N": NEXT n
9135 FOR n=0 TO 2: PRINT  INK 2;
AT n,23;"N": NEXT n
9140 INK 5: PRINT AT 2,5;"KL";AT
 5,25;"KL";AT 17,12;"KL": INK 0
9150 INK 1: PRINT AT 10,16;"J";A
T 6,2;"J";AT 11,1;"J";AT 19,5;"J
";AT 11,6;"J";AT 12,10;"J": INK
0
```

```
9160 INK 3: PRINT AT 9,28;"M";AT
 9,15;"M";AT 4,16;"M";AT 2,14;"M
";AT 16,6;"M";AT 16,28;"M";AT 16
,29;"M": INK 0
9170 PRINT AT 20,15;"LOW SPEED T
RACK"
9180 PRINT AT 20,9;"EXIT"
9190 RETURN
9200 REM *STAGE 7*
9205 INK 2: LET x=10: LET y=1: L
ET z=4
9210 FOR n=0 TO 8: PRINT  INK 2;
AT 2,n;"N": NEXT n
9215 PRINT AT 1,9; INK 0;"(4*ig6
)"
9220 FOR n=0 TO 2: PRINT  INK 2;
AT n,8;"N": NEXT n
9230 FOR n=0 TO 10: PRINT  INK 2
;AT 9,n;"N": NEXT n
9240 FOR n=0 TO 18: PRINT  INK 2
;AT n,13;"N": NEXT n
9250 FOR n=4 TO 13: PRINT  INK 2
;AT 5,n;"N": NEXT n
9260 FOR n=3 TO 13: PRINT AT 13,
n;"N"(cci4): NEXT n
9270 FOR n=0 TO 9: PRINT AT 18,n
;"N": NEXT n
9280 FOR n=18 TO 21: PRINT AT n,
9;"N": NEXT n
9290 FOR n=4 TO 21: PRINT AT n,1
7;"N": NEXT n
9300 FOR n=0 TO 17: PRINT AT n,2
1;"N": NEXT n
9310 FOR n=4 TO 21: PRINT AT n,2
5;"N": NEXT n
9320 FOR n=0 TO 7: PRINT AT n,29
;"N": NEXT n
9330 FOR n=29 TO 31: PRINT AT 7,
n;"N": NEXT n
9340 FOR n=12 TO 21: PRINT AT n,
29;"N": NEXT n
9350 FOR n=29 TO 31: PRINT AT 12
,n;"N": NEXT n
9360 INK 5: PRINT AT 19,20;"KL";
AT 16,3;"KL"
9370 INK 1: PRINT AT 20,11;"J";A
T 11,11;"J";AT 2,17;"J";AT 2,25;
"J": INK 0
9380 INK 3: PRINT AT 6,1;"M";AT
10,15;"M";AT 10,19;"M";AT 10,24;
"M"; INK 0
9390 INK 0: PRINT AT 1,1;"TRACK
7";AT 19,3;"GEAR";AT 20,3;"1--2"
;AT 8,30;"E";AT 9,30;"X";AT 10,3
0;"I";AT 11,30;"T"
9399 RETURN
9400 LET x=1: LET y=10: LET z=2
9410 INK 2: FOR n=0 TO 2: PRINT
AT 12,n;"N": NEXT n
9420 FOR n=12 TO 21: PRINT AT n,
2;"N": NEXT n
9430 FOR n=0 TO 6: PRINT AT 7,n;
"N": NEXT n
9440 FOR n=0 TO 7: PRINT AT n,6;
"N": NEXT n
9450 FOR n=8 TO 25: PRINT AT 2,n
;"N": NEXT n
9460 FOR n=8 TO 25: PRINT AT 7,n
;"N": NEXT n
9470 FOR n=2 TO 7: PRINT AT n,8;
"N": NEXT n
9480 FOR n=2 TO 7: PRINT AT n,25
;"N": NEXT n
9485 FOR n=0 TO 7: PRINT AT n,27
;"N": NEXT n
9490 FOR n=27 TO 31: PRINT AT 7,
n;"N": NEXT n
9495 FOR n=12 TO 20: PRINT AT n,
27;"N": NEXT n
9510 FOR n=27 TO 31: PRINT AT 12
,n;"N": NEXT n: INK 0
9520 INK 5: FOR n=8 TO 20: PRINT
 AT n,16;"KL": NEXT n
9530 INK 1: FOR n=8 TO 20 STEP 2
: PRINT AT n,14;"J";AT n,19;"J":
 NEXT n
9540 INK 3: FOR n=9 TO 20 STEP 2
: PRINT AT n,14;"M";AT n,19;"M":
 NEXT n: INK 0
9560 INK 0: PRINT AT 4,13;"CAUTI
ON";AT 2,1;"STAGE";AT 4,3;"8";AT
 8,30;"E";AT 9,30;"X";AT 10,30;"
I";AT 11,30;"T": FOR n=8 TO 11:
PRINT AT n,1;"(ig6)": NEXT n
9570 RETURN
9598 REM *** screen 9 ***
9600 LET x=1: LET y=10: LET z=2
```

```
9610 INK 2: FOR n=0 TO 7: PRINT
AT n,15;"N";AT n,26;"N": NEXT n
9620 FOR n=12 TO 15: PRINT AT 7,
n;"N";AT 12,n;"N": NEXT n
9630 FOR n=7 TO 12: PRINT AT n,1
2;"N": NEXT n
9640 FOR n=12 TO 18: PRINT AT n,
15;"N": NEXT n
9650 FOR n=15 TO 28: PRINT AT 18
,n;"N": NEXT n
9660 FOR n=18 TO 31: PRINT AT 15
,n;"N": NEXT n
9670 FOR n=3 TO 15: PRINT AT n,1
8;"N": NEXT n
9680 FOR n=23 TO 31: PRINT AT 13
,n;"N": NEXT n
9690 FOR n=3 TO 13: PRINT AT n,2
3;"N": NEXT n
9695 FOR n=18 TO 22: PRINT AT 3,
n;"N": NEXT n
9700 FOR n=26 TO 31: PRINT AT 8,
n;"N": NEXT n
9705 FOR n=0 TO 2: PRINT AT 12,n
;"N": NEXT n
9710 FOR n=12 TO 21: PRINT AT n,
2;"N": NEXT n
9715 FOR n=0 TO 6: PRINT AT 7,n;
"N": NEXT n
9720 FOR n=3 TO 12: PRINT AT 4,n
;"N": NEXT n
9725 FOR n=4 TO 15: PRINT AT n,9
;"N": NEXT n
9730 FOR n=7 TO 18: PRINT AT n,6
;"N": NEXT n
9735 FOR n=6 TO 9: PRINT AT 18,n
;"N": NEXT n
9740 FOR n=9 TO 12: PRINT AT 15,
n;"N": NEXT n
9745 FOR n=15 TO 21: PRINT AT n,
12;"N": NEXT n: INK 0
9750 FOR n=8 TO 11: PRINT AT n,1
;"(ig6)": NEXT n
9755 PRINT AT 13,1;"S";AT 14,1;"
T";AT 15,1;"A";AT 16,1;"G";AT 17
,1;"E";AT 19,1;"9"
9760 PRINT AT 5,19;"DEAD";AT 7,1
9;"SLOW"
9765 PRINT AT 11,19;"GEAR";AT 13
,19;"1..2"
9770 INK 5: PRINT AT 9,16;"KL";A
T 16,22;"KL";AT 6,3;"KL": INK 0
9775 INK 1: PRINT AT 2,6;"J";AT
2,9;"J";AT 2,12;"J";AT 13,4;"J";
AT 10,7;"J";AT 17,13;"J";AT 15,1
4;"J";AT 19,10;"J";AT 11,17;"J";
AT 19,22;"J";AT 20,25;"J";AT 9,2
5;"J";AT 1,24;"J": INK 0
9780 INK 3: PRINT AT 2,5;"M";AT
2,8;"M";AT 2,11;"M";AT 19,27;"M"
;AT 9,11;"M";AT 16,4;"M": INK 0
9785 PRINT AT 9,30;"E";AT 10,30;
"X";AT 11,30;"I";AT 12,30;"T"
9790 RETURN
9798 REM *** screen 10 ***
9800 LET x=1: LET y=11: LET z=2
9810 INK 2: FOR n=0 TO 19: PRINT
 AT n,10;"N": NEXT n
9820 FOR n=0 TO 8: PRINT AT n,26
;"N": NEXT n
9830 FOR n=27 TO 31: PRINT AT 8,
n;"N": NEXT n
9840 FOR n=0 TO 10: PRINT AT 8,n
;"N": NEXT n
9850 FOR n=0 TO 3: PRINT AT 13,n
;"N": NEXT n
9860 FOR n=13 TO 21: PRINT AT n,
3;"N": NEXT n
9870 INK 1: FOR n=11 TO 26: PRIN
T AT 9,n;"J";AT 10,n;"J";AT 15,n
;"J";AT 16,n;"J": NEXT n
9880 FOR n=11 TO 14: PRINT AT n,
11;"J";AT n,12;"J";AT n,25;"J";A
T n,26;"J": NEXT n
9890 INK 3: FOR n=14 TO 23: PRIN
T AT 11,n;"M";AT 12,n;"M";AT 13,
n;"M";AT 14,n;"M": NEXT n
9900 INK 0: FOR n=11 TO 25: PRIN
T AT 1,n;"(g6)";AT 2,n;"(g6)";AT
 3,n;"(g6)": NEXT n
9910 PRINT AT 1,15;"FINISH";AT 2
,2;"STAGE";AT 4,3;"10";AT 6,2;"G
EAR..2"
9915 PRINT AT 2,16; INK 0; BRIGH
T 0;"EXIT"
9920 RETURN
9999 GO TO 3000
```

COLUMBUS

Take ship for the New World and found an empire in a thrilling simulation of the struggles of European nations to compete for a share of America's riches in the 15th Century.

Columbus, by Nicholas Holgate, was a runner up in the 1984 Cambridge Awards competition. The game is for two to five players, but should prove entertaining for one.

Enter listing 1 first, and SAVE it with SAVE "col" LINE 10. Then Enter listing 2 and SAVE with SAVE "Columbus" LINE 3. Then the first listing will automatically RUN and LOAD the second. The program runs on the 48K Spectrum.

Each turn begins with a financial statement, following which you may choose a number of options.

Ships allows you to explore, build ships and improve their design. It also allows you to engage in piracy, invade an opponent, or seek to blockade his ports if at war. A further option is to protect trade or move troops in convoy.

Soldiers gives four options. You may explore, attack or defend in the New World. You may also recruit new troops.

Spies allows you to examine certain details of your rivals' progress and plans.

Crop changes allows you to instruct your colonists on what products they should aim to send home. What you decide will depend on the type of land colonised.

Tax changes may be used to increase revenue, but high taxes can deter colonists.

War allows you to plot an attack on a player the following turn. A declaration of war will only be announced on that turn.

The different types of land are colour coded. White indicates tundra or desert, of territorial significance only. Yellow is plains, the best for growing crops. Green is forest producing timber thus cutting shipbuilding costs. Purple may produce silver or gold.

Some land is inhabited, and you will have to deal with the natives there. You can trade with them or oppress them.

At the end of each round, all players may see a report on the outcome of trading and wars, along with an indication of who is winning. The game ends when one player has achieved colonial domination, but that player may not be the overall winner.

Columbus uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Printout.

Listing 1

```
   3 PRINT AT 9,5; FLASH 1;"Plea
se stop the tape.": BEEP .5,.5:
PAUSE 200: CLS
   5 GO TO 90
  25 BEEP .5,.5: PRINT AT 21,19;
"Try again!": RETURN
  90 LET f=0: CLS : PRINT AT 10,
11; INK 1; INVERSE 1;"COLUMBUS":
 GO SUB 9000
 100 INPUT "How many players ? (
2-5) ";x$
 103 IF CODE x$<50 OR CODE x$>53
 THEN  BEEP .5,.5: GO TO 100
 104 LET p=VAL x$: POKE 65471,p
 125 LET n$="SPAIN   PORTUGALHOL
LAND FRANCE  ENGLAND ": DEF FN g
$(n$,x)=n$(8*x-7 TO x*8)
 126 FOR x=1 TO p
 128 IF CODE n$(x*8-7)=32 THEN
PRINT AT 10+x,6; INK x;n$(8*x-6
TO 8*x);"  is playing": GO TO 13
0
 129 PRINT AT 10+x,6; INK x;FN g
$(n$,x);" is playing."
 130 NEXT x
 131 PAUSE 200
 135 CLS : PRINT AT 10,2; FLASH
1;"Start tape running please."
 140 LOAD "Columbus"
 150 STOP
9000>DATA 119,170,221,255,119
,170,221,255
9001 DATA 0,16,120,60,120,147,25
4,0
9002 DATA 25,26,60,60,56,88,24,2
4
9003 DATA 28,20,28,42,42,42,42,1
07
9004 DATA 0,8,30,60,30,201,127,0
9005 DATA 0,16,16,126,255,86,118
,118
9006 DATA 16,16,56,56,124,108,23
8,238
9007 DATA 24,126,122,223,126,24,
24,24
9008 DATA 152,88,60,60,28,26,24,
24
9010 DATA 255,129,129,129,129,12
9,129,255
9012 DATA 102,102,126,126,126,12
6,126,126
9015 DATA 24,24,60,60,60,24,24,2
4
9020 LET n=12: FOR x=1 TO n*8
9022 READ p
9024 POKE 65367+x,p
9025 NEXT x
9030 RETURN
```

Listing 2

```
   3 LET p=PEEK 65471: LET x$=ST
R$ p
   4 IF p=0 THEN  INPUT "How man
y players ? (2-5)";x$: IF CODE x
$<50 OR CODE x$>53 THEN  BEEP .5
,.5: GO TO 4
   5 LET p=VAL x$: GO TO 90
   7 LET m=m+1: RETURN
  10 INPUT "Press ENTER to conti
nue.";x$: RETURN
  15 INK 0: PAPER 7: RETURN
  20 LET m=m+1: LET x$=STR$ x: I
F x<0 THEN  INK 2
  21 IF m>21 THEN  LET m=21
  22 PRINT AT m,30-LEN x$; PAPER
 7;"(sp)": PRINT AT m,31-LEN x$;
```

```
x: INK 0
  23 IF LEN x$=1 THEN  PRINT AT
m,28; FLASH 0; PAPER 7;"(sp)"
  24 RETURN
  25 BEEP .5,.5: PRINT AT 21,19;
"Try again!": RETURN
  28 LET a=8
  29 LET b=21
  30 FOR x=a TO b: PRINT AT x,18
;"(14*sp)": NEXT x: RETURN
  35 INPUT "Choice (number) ? ";
x$
  40 IF CODE x$<48 OR CODE x$>48
+n THEN  BEEP .5,.5: GO TO 35
  45 RETURN
  50 LET c=INT ((a(b,a)/10-INT (
a(b,a)/10))*10+.5): RETURN
  55 LET b(q,z)=INT (b(q,z)/2):
RETURN
  60 LET k=1+INT (RND*(p-.5)): R
ETURN
  65 LET c=INT (a(b,a)/10+.2): R
ETURN
  75 LET a=a-m: LET b=b-n: RETUR
N
  90 LET f=1: GO SUB 7280: GO SU
B 8000
 105 LET co=0: LET ff=0: LET f=0
 110 LET nb=0: LET cr=7: LET int
=.1: LET m1=250: LET m2=10: LET
t=1488: LET h=100: DIM c$(p,300-
p*20): DIM b(p,80)
 112 LET i$="SPHFE": LET m$="Spa
nish(3*sp)PortugueseDutch(5*sp)F
rench(4*sp)English(3*sp)"
 115 LET s$="(sp)submit(2*sp)to(
2*sp)ally(2*sp)with(2*sp)trade w
ith(2*sp)mistrust(4*sp)attack(5*
sp)": LET h$="explore invade(2*s
p)blockadepiracy(2*sp)convoy(2*s
p)patrol(2*sp)build(3*sp)design(
2*sp)nothing(sp)"
 120 LET p$="": FOR k=1 TO p: LE
T p$=p$+CHR$ (k+48): NEXT k: LET
 p$=p$(p)+p$( TO p-1)
 125 LET n$="(sp)SPAIN(2*sp)PORT
UGALHOLLAND(2*sp)FRANCE ENGLAND(
sp)": DEF FN g$(n$,q)=n$(8*q-7 T
O 8*q)
 127 DIM q(12,5): FOR k=1 TO 12:
 LET q(k,1)=INT (h*RND)+3: LET q
(k,2)=1+RND/5: LET q(k,3)=.1+RND
+RND: LET q(k,4)=INT (RND*h)+1:
NEXT k
 128 LET q(8,4)=INT (250-h*RND):
 LET q(9,4)=INT (175-h*RND)
 130 DIM e$(21,4): FOR k=1 TO 21
: LET e$(k)=CHR$ (k+64)+CHR$ (97
+25*RND)+CHR$ (97+25*RND)+CHR$ (
97+25*RND): NEXT k
 135 LET f$="Corn(4*sp)Fish(4*sp
)Furs(4*sp)Hides(3*sp)Timber(2*s
p)Sugar(3*sp)Tobacco Gold(4*sp)S
ilver(2*sp)Cotton(2*sp)Coffee(2*
sp)"
 140 FOR k=1 TO p: LET b(k,6)=IN
T (RND*2000+10500): LET b(k,12)=
3+INT (4*RND): LET b(k,21)=INT (
h+RND*h): LET b(k,24)=INT (20+RN
D*20)/h: LET b(k,25)=1
 145 LET b(k,29)=300+INT (200*RN
D): LET b(k,32)=INT (h+RND*h): L
ET b(k,56)=50: LET b(k,57)=50: N
EXT k
 200 LET kkk=0: LET t=t+4: FOR k
=1 TO p: LET b(k,9)=b(k,5): NEXT
 k
 205 LET p$=p$(2 TO p)+p$(1)
 210 LET kkk=kkk+1
 215 IF kkk=p+1 THEN  GO TO 7000
 220 LET q=VAL p$(kkk)
 222 IF CODE c$(q,1)<>32 THEN  L
ET b(q,20)=b(q,20)+b(q,21)
 225 LET b(q,74)=1: LET b(q,75)=
0: LET b(q,76)=0:: LET w=INT (h+
RND*h+5*(t-1496)+b(q,8)*4): LET
b(q,21)=INT (w-b(q,24)*w):: FOR
y=1 TO 3: LET b(q,28+5*y)=3: LET
 b(q,27+5*y)=b(q,27+5*y)+b(q,29+
5*y): NEXT y
 230 LET ch=0: IF b(q,73)>10 THE
N  LET b(q,25)=b(q,25)+.1
 235 IF b(q,73)>h THEN  LET b(q,
25)=b(q,25)+.1
 250 PAPER q: INK 7: FLASH 1: CL
S : FLASH 0: PRINT AT 8,12;FN g$
(n$,q);AT 12,8;"The year is ";t:
 GO SUB 10
 255 GO SUB 15
 300 CLS : BORDER q: IF q<>3 THE
N  PRINT AT 3,9;"Your Majesty !"
 305 IF q=3 THEN  PRINT AT 3,8;"
Fellow burghers !"
 310 PRINT AT 6,2;"The Treasurer
 begs leave to";AT 7,12;"report.
": GO SUB 10
 312 IF b(q,6)<(-4000-(2000*RND)
) THEN  GO SUB 6800
 315 CLS : PRINT AT 1,12; INK q;
 FLASH 1;FN g$(n$,q)
 320 LET m=3: PRINT AT 2,29; INV
ERSE 1;"£";AT 4,1;"Funds"; INVER
SE 0;" (";t-4;")": LET x=b(q,6):
 GO SUB 20
 325 LET sh=0: FOR k=1 TO 7: LET
 sh=sh+b(q,11+k): LET b(q,11+k)=
0:: NEXT k: LET b(q,12)=sh
 330 LET m=7: PRINT AT 7,1; PAPE
R 5;"Plus": PRINT AT 8,1;"Taxes"
 335 PRINT AT 8,18; PAPER 6;"(";
b(q,24)*h;"%;")": LET x=INT b(q
,70): GO SUB 20
 337 IF b(q,10)<0 THEN  LET b(q,
10)=0
 340 LET m=11: PRINT AT 11,1; IN
K 7; PAPER 2;"Minus": PRINT AT 1
2,1;"Fleet (";  PAPER 5;sh; PAPER
 7; PAPER 7;" old + "; PAPER 5;b
(q,19); PAPER 7;" new)": LET x=I
NT ((b(q,19)*m1*20)/(b(q,10)+10)
+b(q,73)+sh*m1): GO SUB 20
 342 LET b(q,12)=b(q,12)+b(q,19)
: LET so=b(q,32)+b(q,37)+b(q,42)
 345 PRINT AT 13,1;"Soldiers";AT
 13,18;"(";  INK 2;  INVERSE 1;so;
 INK 0;  INVERSE 0;")": LET x=m2*
so: GO SUB 20
 350 PRINT AT 14,1;"Crop subsidi
es": LET x=b(q,69): GO SUB 20
 355 PRINT AT 15,1;"Spies": LET
x=b(q,1): GO SUB 20
 357 IF b(q,6)<0 THEN  PRINT AT
16,1;"Interest";AT 16,18; PAPER
6;"(";int*h;"%)": LET x=INT (int
*-b(q,6)): LET b(q,6)=b(q,6)-x:
LET x$=STR$ x: PRINT AT 16,31-LE
N x$;x$
 360 LET b(q,6)=INT (b(q,6)+b(q,
70)-sh*m1-(b(q,19)*m1*20/(b(q,10
)+10))-so*m2-b(q,69)-b(q,1)-b(q,
73)): LET b(q,19)=0: LET b(q,73)
=0
 362 PLOT 200,26: DRAW 48,0
 365 LET m=18: PRINT AT 19,1; IN
VERSE 1;"Funds"; INVERSE 0;" (";
t;")": LET x=b(q,6): GO SUB 20
 366 LET b(q,69)=0: LET b(q,1)=0
 370 GO SUB 10: BORDER 7: CLS
 400 FOR y=1 TO 21: PRINT AT y,1
; PAPER 5; INK 7;"AAAAAAAAAAAAAA
AAA": NEXT y: IF f=10 THEN  RETU
RN
 405 PRINT AT 0,21; INVERSE 1;FN
 g$(n$,q)
 410 IF CODE c$(q,1)<>32 THEN  L
ET z=q: GO SUB 8500: GO TO 420
 415 PRINT AT 3,19;"No colonies"
;AT 4,19;"founded yet.": GO SUB
10
 417 LET a=3: LET b=6: GO SUB 30
 420 LET m=1: INK 7: PAPER 5: PR
INT AT 2,19;"Fleet": LET x=b(q,1
2): GO SUB 20
 425 INK 7: PAPER 2: PRINT AT 3,
19;"Army": LET x=so: GO SUB 20
 430 INK 7: PAPER 4: PRINT AT 4,
19;"Old settlers": LET m=4: LET
x=b(q,20): GO SUB 20
 432 GO SUB 15
 435 LET m=6: PAPER 6: PRINT AT
6,19;"New settlers": LET x=b(q,2
1): GO SUB 20: PAPER 7
 450 GO SUB 28: PRINT AT 10,19;"
Which do you";AT 11,19;"wish to
use?"
 455 PRINT AT 13,19; INK 1;"1 Sh
ips"
 456 PRINT AT 14,19; INK 2;"2 So
ldiers"
 457 PRINT AT 15,19; INK 3;"3 Sp
ies"
 458 PRINT AT 16,19; INK 4;"4 Cr
op change"
 460 PRINT AT 17,19; INK 3;"5 Ta
x change"
 461 PRINT AT 18,19; INK 2;"6 Wa
r"
 463 PRINT AT 19,19;"7 Nothing"
 470 LET n=7: GO SUB 35
 480 GO SUB 28
 485 GO TO (CODE x$-48)*h+400
 500 IF ch=1 THEN  PRINT AT 15,1
9;"All done.": GO TO 450
 505 PRINT AT 9,19;"What do you"
;AT 10,19;"wish to do?"
 510 LET m=11: FOR y=1 TO 9: PRI
NT AT 11+y,18;y;"(sp)";FN g$(h$,
y): IF y<8 THEN  LET x=b(q,12+y)
: GO SUB 20
 512 NEXT y
 515 LET n=9: GO SUB 35
 522 IF f=15 THEN  LET f=0: GO T
O 532
 525 LET s=VAL x$: IF s=9 THEN
GO SUB 28: GO TO 555
 527 IF s=8 THEN  GO TO 550
 530 INPUT "How many ships ? ";x
$: LET n=9: GO SUB 40: LET ch=1
 532 LET i=VAL x$: IF s=7 AND i>
10 THEN  LET i=10000: GO TO 535
 533 IF s=7 THEN  LET b(q,19)=i:
 LET m=17: LET x=i:: GO SUB 20:
LET i=0: GO TO 515
 535 IF i>b(q,12) THEN  BEEP .5,
.5: PRINT AT 21,18; FLASH 1;"Too
 many(2*sp)": GO TO 530
 540 LET b(q,12)=b(q,12)-i: LET
b(q,s+12)=i: LET m=10+s: LET x=i
: GO SUB 20: LET m=1: LET x=b(q,
12): PAPER 5: INK 7: FLASH 1: GO
 SUB 20: GO SUB 15: FLASH 0
 545 IF b(q,12)>0 THEN  GO TO 51
5
 547 IF b(q,12)<=0 THEN  GO TO 5
55
 550 INPUT "How much money ? ";x
```

continued on page 108

continued from page 107

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$
 552 IF CODE x$>48 AND CODE x$<5
8 THEN  LET b(q,73)=VAL x$: LET
m=18: LET x=VAL x$: GO SUB 20: P
RINT AT 19,30-INT LEN x$;"£": GO
 TO 545
 555 FOR k=13 TO 18
 556 GO SUB 28: IF b(q,k)=0 THEN
  NEXT k: GO TO 450
 557 PRINT AT k-1,21; FLASH 1;FN
g$(h$,k-12)
 558 IF k=13 THEN  GO SUB 8600
 560 IF k=14 OR k=17 THEN  GO SU
B 8700
 595 NEXT k
 596 GO TO 450
 600 LET a=15: GO SUB 29: LET g=
7: PRINT AT 14,28;"Men": LET m=1
5: FOR z=1 TO 3: PRINT AT 15+z,1
9;"Force ";z: LET x=b(q,27+z*5):
 GO SUB 20: NEXT z
 605 IF f=5 THEN  LET f=0: GO TO
653
 606 FOR y=1 TO 3: PRINT AT 15+y
,25; INVERSE 1;y: PAUSE 50: IF f
f=0 AND b(q,25+5*y)<=0 THEN  NEX
T y: GO TO 650
 607 LET a=b(q,25+5*y): LET b=b(
q,26+5*y): LET y$="C": PRINT AT
a,b;y$: PAUSE h: IF ff=1 THEN  L
ET g=0: NEXT y: LET ff=0: LET q=
qq: GO SUB 10: GO TO 700
 608 LET g=7: LET f=2: GO SUB 86
17: IF x$="x" OR b(q,28+5*y)<=0
THEN  NEXT y: GO TO 650
 610 IF a(b,a)=0 THEN  PRINT AT
a,b; PAPER 7; INK 5;"A": PRINT A
T 21,20;"sea": GO SUB 75: GO TO
608
 612 GO SUB 8410
 620 GO SUB 50: PRINT AT a,b; PA
PER c;y$
 625 LET b(q,28+5*y)=b(q,28+5*y)
-1: GO SUB 65: IF c=0 THEN  GO S
UB 8636
 630 LET b(q,25+5*y)=a: LET b(q,
26+5*y)=b: IF b(q,28+5*y)<=0 THE
N  NEXT y: GO TO 650
 635 GO TO 608
 650 LET a=8: GO SUB 29: LET f=5
: GO TO 600
 653 FOR y=1 TO 3: PRINT AT 15+y
,25; FLASH 1;y: IF y>1 THEN  PRI
NT AT 15+y-1,25; INVERSE 1;y-1
 655 INPUT "Recruiting how many
? ";x$
 660 IF CODE x$<48 OR CODE x$>57
 THEN  BEEP .5,.5: PRINT AT 21,1
9;"Try again": GO TO 655
 665 IF VAL x$>500 THEN  LET x$=
"a": GO TO 660
 670 LET b(q,29+5*y)=VAL x$: NEX
T y
 695 GO TO 450
 700 PRINT AT 9,22; PAPER 3; INK
 7;"SPIES"
 705 LET a=10: GO SUB 29: PRINT
AT 11,19;"Spy on whom?"
 710 LET m=1: FOR x=1 TO p
 712 IF x=q THEN  NEXT x: GO TO
718
 714 IF CODE n$(x*8-7)=32 THEN
PRINT AT 12+m,20; INK x;x;"(sp)"
;n$(8*x-6 TO 8*x): LET m=m+1: NE
XT x: GO TO 718
 715 PRINT AT 12+m,20; INK x;x;"
(sp)";FN g$(n$,x): LET m=m+1
 717 NEXT x
 718 PRINT AT 12+m,20;p+1;"(2*sp
)";"NOBODY": IF f=6 THEN  PRINT
AT 19,19;"(One only)"
 720 LET n=p+1: GO SUB 35
 730 LET z=VAL x$: IF z=q THEN
BEEP .5,.5: GO TO 720
 735 IF z=p+1 THEN  LET f=0: GO
TO 450
 736 IF f=6 THEN  LET b(q,5)=z:
LET f=0: GO TO 450
 740 LET a=11: GO SUB 29
 742 LET b(q,1)=b(q,1)+h
 745 PRINT AT 11,20;"For what ?"
 750 PRINT AT 13,20; INK 3;"1 Fi
nances";AT 14,20; INK 4;"2 Colon
ies";AT 15,20; INK 1;"3 Ships";A
T 16,20; INK 2;"4 Troops";AT 17,
20; INK 4;"5 Crops";AT 18,20; IN
K 2;"6 War plans"
 752 LET n=6: GO SUB 35
 755 LET a=11: GO SUB 29
 760 LET s=VAL x$: IF s<>5 THEN
 PRINT AT 11,21; INVERSE 1;FN g$
(n$,z)
 762 IF s=1 THEN  PRINT AT 13,19
;"Funds:£": LET m=12: LET x=INT
(b(z,6)*(1+RND-RND)): GO SUB 20:
 PRINT AT 14,19;"Tax(%)": LET x=
INT (b(z,24)*h+RND/20-RND/20): G
O SUB 20: GO SUB 10: GO TO 700
 763 LET f=0: IF s=5 AND b(z,11)
>0 THEN  LET f=2
 765 IF s=5 THEN  LET m=9: FOR n
=1 TO cr+f: PRINT AT 9+n,19;FN g
$(f$,n): LET x=b(z,55+n): GO SUB
 20: PRINT AT m,31;"%": NEXT n:
GO SUB 10: GO TO 700
 770 IF s=2 THEN  GO SUB 8500: G
O TO 700
 775 IF s=3 THEN  LET m=14: PRIN
T AT 13,19;"Fleet": FOR n=1 TO 7
: PRINT AT 14+n,19;FN g$(h$,n):
LET x=b(z,12+n): GO SUB 20: NEXT
 n: GO SUB 10: GO TO 700
 780 IF s=4 THEN  LET qq=q: LET
q=z: LET ff=1: GO TO 600
 785 IF s=6 AND b(z,5)<>0 THEN
PRINT AT 13,21;"Plans to";AT 14,
21;"attack";AT 15,21; FLASH 1; I
NK b(z,5);FN g$(n$,b(z,5)): PAUS
E 200: GO TO 700
 787 IF s=6 AND b(z,9)<>0 THEN
PRINT AT 13,21;"Attacking";AT 14
,21; FLASH 1; INK b(z,9);FN g$(n
$,b(z,9)): PAUSE 200: GO TO 700
 790 IF s=6 THEN  PRINT AT 14,21
;"No plans": PAUSE h: GO TO 700
 800 LET f=0: PRINT AT 8,19; PAP
ER 4; INK 7;"CROP CHANGE"
 802 IF b(q,11)>0 AND cr=7 THEN
 LET f=2
 805 LET a=10: GO SUB 29
 810 LET m=9: FOR y=1 TO cr+f: P
RINT AT 9+y,19;FN g$(f$,y): LET
x=b(q,55+y): GO SUB 20: PRINT AT
 9+y,31;"%": NEXT y
 815 LET w=0: FOR y=1 TO cr+f: P
RINT AT 9+y,19; FLASH 1;FN g$(f$
,y): IF y>1 THEN  PRINT AT 8+y,1
9;FN g$(f$,y-1)
 816 IF (y=8 OR y=9) AND b(q,11)
<=0 THEN  LET b(q,55+y)=0: GO TO
 835
 817 IF y=5 AND b(q,10)<=0 THEN
 LET b(q,60)=0: GO TO 835
 820 INPUT "What percentage ? ";
x$: LET n=9: GO SUB 40
 822 LET z=VAL x$: IF z>h THEN
BEEP .5,.5: PRINT AT 21,19;"Too
much": GO TO 820
 825 IF z>b(q,55+y) THEN  LET b(
q,69)=INT ((b(q,69)+(z-b(q,55+y)
)*b(q,8))*b(q,24)*2)
 830 LET w=w+z: LET b(q,55+y)=z:
 LET x=z: LET m=8+y: GO SUB 20
 832 IF w=h THEN  FOR w=y+1 TO c
r+f: LET x=0: GO SUB 20: LET b(q
,55+w)=0: NEXT w: PRINT AT 21,19
;"All done.": LET y=cr+f
 835 NEXT y
 840 LET y=0: FOR x=1 TO 12: LET
 y=y+b(q,55+x): NEXT x
 845 IF y>100 THEN  LET a=9: GO
SUB 29: PRINT AT 10,19;"Your pla
nned";AT 11,19;"output is";AT 12
,19;"above 100%.";AT 14,19;"Try
again!": PAUSE 200: GO TO 800
 895 PAUSE h: GO TO 450
 900 PRINT AT 9,19; INK 7; PAPER
 3;"TAX CHANGE"
 910 PRINT AT 12,19;"Old rate":
LET x=b(q,24)*h: LET m=11: GO SU
B 20: PRINT AT 12,31;"%"
 915 PRINT AT 14,19;"New rate ?"
;AT 16,19;"(Between 10";AT 17,19
;"and 50 %)": PRINT AT 14,31;"%"
 920 LET n=9: GO SUB 35
 925 LET x=INT VAL x$: IF x>50 O
R x<10 THEN  BEEP .5,.5: GO TO 9
15
 930 LET b(q,24)=x/h: LET m=13:
GO SUB 20
 945 PAUSE h: GO TO 450
1000 LET b(q,5)=0: PRINT AT 9,22
; INK 7; PAPER 2;"WAR"
1010 IF b(q,9)>0 THEN  LET y=b(q
,9): PRINT AT 11,19;"You are now
";AT 12,19;"attacking";AT 13,19;
 INK y; FLASH 1;FN g$(n$,y): GO
TO 1020
1015 PRINT AT 11,19;"You are not
";AT 12,19;"attacking.";AT 13,19
;"anyone."
1020 PRINT AT 15,19;"You are bei
ng";AT 16,19;"attacked by"
1025 LET m=17: FOR k=1 TO p
1027 IF b(k,9)=q THEN  PRINT AT
m,19; INK k; FLASH 1;FN g$(n$,k)
: GO SUB 7
1028 NEXT k
1030 IF m=17 THEN  PRINT AT m,19
;"nobody."
1035 GO SUB 10: LET a=11: GO SUB
 29
1040 PRINT AT 9,19;"Next turn,";
AT 10,19;"do you plan";AT 11,19;
"to attack": LET f=6: GO TO 710
1200 GO TO 210
5000 BORDER 7: PRINT AT 20,6; FL
ASH 1;FN g$(n$,z); FLASH 0;" has
 won   !"
5010 COPY : GO SUB 10
5020 CLS : LET f=10: GO SUB 400
5030 PRINT AT 0,3; INK 1;"THE NE
W WORLD": FOR z=1 TO p: GO SUB 8
500: NEXT z
5055 GO SUB 9100
5060 COPY : INPUT "Press any key
 for rematch! ";x$
5070 CLEAR : RUN
6000 IF a(b,a)<58 THEN  GO TO 61
00
6010 LET aa=a: LET bb=b: LET a=1
5: GO SUB 29
6012 LET c=INT (a(bb,aa)/10)-5
6013 IF d(c,q)=1 THEN  GO SUB 60
50: GO SUB 6085: RETURN
6015 PRINT AT 15,19;"You find";A
T 16,19;"the "; FLASH 1;e$(c)
6020 PRINT AT 18,19;"Will you";A
T 19,19;"1 Fight";AT 20,19;"2 Tr
ade"
6025 INPUT "Strategy (1-2) ?";x$
6030 IF CODE x$<49 OR CODE x$>50
 THEN  BEEP .5,.5: GO TO 6025
6032 LET a=18: LET b=21: GO SUB
30: LET d=VAL x$(1)
6035 IF d(c,q)=0 THEN  LET d(c,q
)=INT (2+3.4*RND)
6040 LET a=aa: LET b=bb: IF d=1
THEN  LET d(c,q)=5
6045 IF d(c,q)<5 AND y$="C" THEN
  LET a=a-m: LET b=b-n
6050 IF d(c,q)<5 THEN  PRINT AT
19,19;"They";AT 20,18;s$(d(c,q)*
12-11 TO d(c,q)*12);AT 21,19;"yo
u": PAUSE 50: RETURN
6060 PRINT AT 18,21; FLASH 1;"BA
TTLE!": IF y$="C" THEN  LET v=b(
q,27+5*y)/(d(c,6)+1)
6065 PAUSE h: IF y$="E" THEN  LE
T v=b(q,k)*25/(d(c,6)+1)
6070 LET d(c,6)=INT (d(c,6)-v*d(
c,6)): IF d(c,6)<=0 OR v>1 THEN
 PRINT AT 19,21; FLASH 1;"VICTOR
Y": LET d(c,q)=1: PRINT AT 20,19
;"Land and";AT 21,19;"slaves tak
en": GO TO 6085
6075 PRINT AT 19,21; FLASH 1;"DE
FEAT!": IF y$="C" THEN  LET b(q,
27+5*y)=INT (b(q,27+5*y)*(.9-RND
/2)): LET a=a-m: LET b=b-n: RETU
RN
```

continued on page 113

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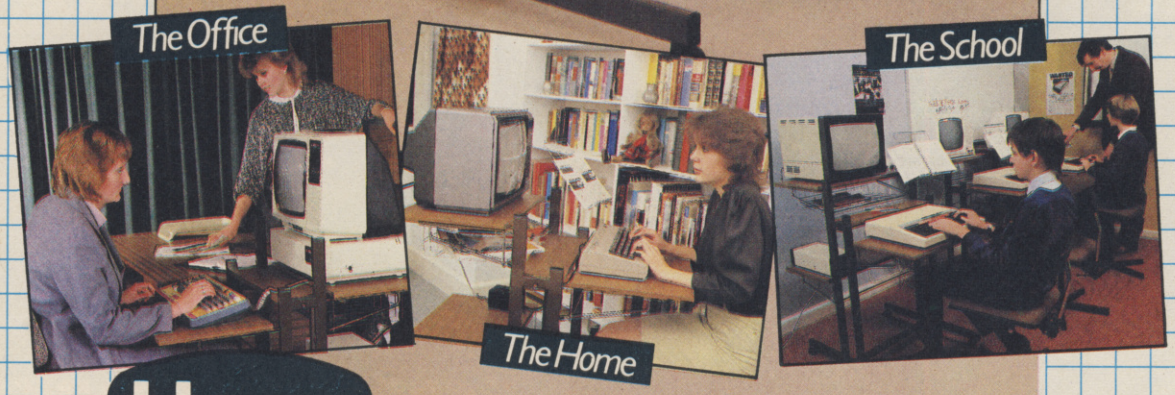

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A western action game for your Spectrum which really does provide something quite different and exciting. You are Kidd Rivers, the hero of the game and you must leap aboard the runaway stage and guide it safely over the plains and through the treacherous mountains. Then just as you thought you were safe, fight off the attacking Indians.

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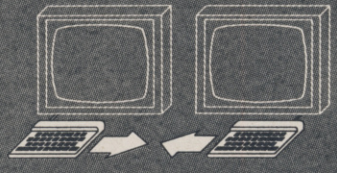
MACHINE AGAINST MACHINE



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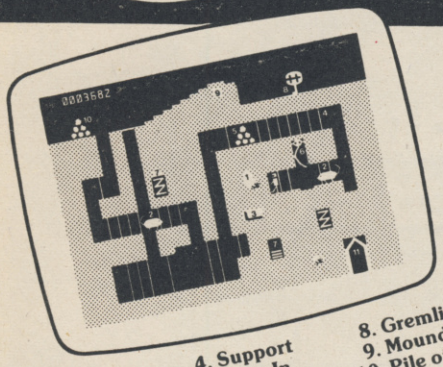

1. Nuggets
2. Giant Rats
3. Burrowing Rat
4. Support
5. Cave In
6. Snake
7. Snake Nest
8. Gremlin
9. Mound
10. Pile of Earth
11. Cave

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In 1849 the Great American Gold Rush started. Almost everyone who could sold up everything and dashed to the west coast to look for this precious metal – including you!

You must excavate this precious metal – but can you survive the giant rats and that vicious Gremlin which will come to infest your mine? Can you trick the snakes into leaving their comfortable nests and destroy the rats for you? Can you keep the Gremlin at bay?

Riches await you – but so do the hazards!

ROCKET MAN

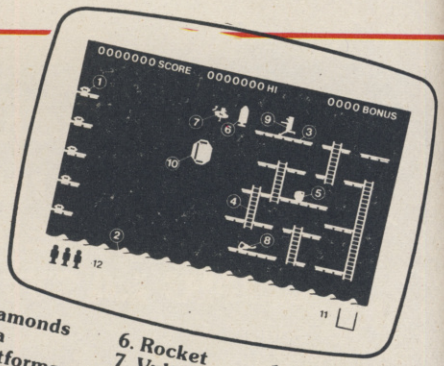
Get rich quick by collecting Diamonds that are simply lying there waiting for you!

Oh . . . I forgot to mention that there are one or two problems!

There is an expanse of shark infested water between you and the Diamonds and a strange breed of Bubble that seems hell bent on getting you in it! Somehow you must cross it . . . .

You have a Rocket Pack to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

Oh . . . but don't run out of fuel on the way – otherwise it's . . . SPLASH!



1. Diamonds
2. Sea
3. Platforms
4. Ladders
5. Fuel Cans
6. Rocket
7. Vulture
8. Leg of Lamb
9. Player
10. Bubloid
11. Fuel Gauge
12. Men remaining

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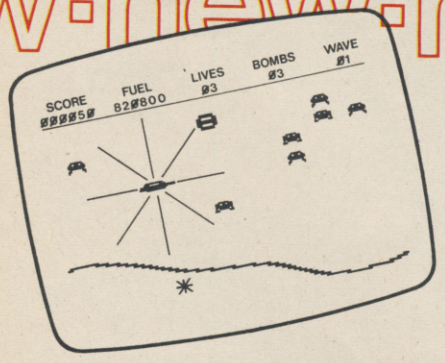

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